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Patent and Trademark Office

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,227,829, Re. S.N. 398,755, Filed July 15, 1982, Cl. 405/20, SOIL EROSION PREVENTION BLOCKS, Kossuth J., Landry, Jr., Owner of Record: *Inventor,* Attorney or Agent: Guy E. Matthews, Ex. Gp.: 356

4,257,893, Re. S.N. 478,447, Filed Mar. 24, 1983, Cl. 210/169, PORTABLE PURIFICATION DEVICE FOR USE IN AQUARIUMS, Todd J. Burton, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 176

4,263,551, Re. S.N. 485,850, Filed Apr. 18, 1983, Cl. 324/233, METHOD AND APPARATUS FOR IDENTIFYING CONDUCTIVE OBJECTS BY MONITORING THE RESISTIVE COMPONENT OF IMPEDANCE CHANGE IN A COIL SYSTEM CAUSED BY THE OBJECT, William D. Gregory, Owner of Record: *President and Directors of Georgetown University, Washington, D.C.,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 252

4,319,657, Re. S.N. 444,863, Filed Nov. 26, 1982, Cl. 180/219, AIR INTAKE CONDUITRY FOR A MOTORCYCLE, Kazuhiko Nomura, Owner of Record: *Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 316

4,320,960, Re. S.N. 512,808, Filed July 11, 1983, Cl. 355/14R, SENSOR CONTROLLING IN COMPUTER FANFOLD REPRODUCTION, Joseph W. Ward, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: Ronald Zibelli, et al., Ex. Gp.: 215

4,344,860, Re. S.N. 512,306, Filed July 11, 1983, Cl. 252/389, STABILIZATION OF SILICATES USING SALTS OF SUBSTITUTED NITROGEN OR SULFUR CONTAINING SILICONATES, Edwin P. Plueddemann, Owner of Record: *Dow Corning Corp., Midland, Mich.,* Attorney or Agent: James E. Bittell, Ex. Gp.: 223

4,352,918, Re. S.N. 509,479, Filed June 30, 1983, Cl. 528/89, PROCESS FOR PREPARING EPOXY RESINS HAVING IMPROVED PHYSICAL PROPERTIES WHEN CURED USING QUATERNARY PHOSPHONIUM CATALYSTS, Ross C. Whiteside, Jr., et al., Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 143

4,353,556, Re. S.N. 512,139, Filed July 8, 1983, Cl. 273/186.A, GOLF CLUB SWING TRAINING AID, James M. Self, et al., Owner of Record: *Golf Bands Products/Louisianna Partnership, New Orleans, La.,* Attorney or Agent: Arthur Schwartz, et al., Ex. Gp.: 334

4,369,616, Re. S.N. 512,057, Filed July 8, 1983, Cl. 192/105, CENTRIFUGAL CLUTCH AND BRAKE FOR LAWN MOWER, John M. Cody, et al., Owner of Record: *Inventors,* Attorney or Agent: A. Yates Dowell, Jr., et al., Ex. Gp.: 352

4,375,989, Re. S.N. 501,502, Filed June 6, 1983, Cl. 106/300, COATED TITANIUM DIOXIDE PIGMENT AND A PROCESS FOR THE PRODUCTION OF THE SAME, Pekka Immanuel Makinen, Owner of Record: *Kemira Oy, Helsinki, Finland,* Attorney or Agent: Norbert P. Holler, et al., Ex. Gp.: 113

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,753,421, Reexam. No. 90/000,423, Requested: July 22, 1983, Cl. 119/29, METHOD AND APPARATUS FOR CONTROLLING AN ANIMAL, Richard M. Peck, Owner of Record: *Inventor,* Attorney or Agent: Lane, Aitken & Kananen, Ex. Gp.: 330, Requester: Shiley Corp., Cincinnati, Ohio

3,818,837, Reexam. No. 90/000,431, Requested: Aug. 5, 1983, Cl. 104/166, VEHICLE AND TRACK SYSTEM, Charles E. Jacoby, et al., Owner of Record: *Si Handling Systems, Inc., Easton, Pa.,* Attorney or Agent: Seidel, Gonda & Goldhammer, Ex. Gp.: 310, Requester: Evana Tool and Engineering, Inc., Evansville, Ind.

4,352,822, Reexam. No. 90/000,429, Requested: Aug. 8, 1983, Cl. 426/3, GUM BASE CHEWING GUM CONTAINING SAME AND METHOD, Subraman P.

Cherukuri, et al., Owner of Record: *Nabisco Brands, Inc., New York, N.Y.*, Attorney or Agent: Richard Kornutik, Ex. Gp.: 170, Requester: Wm. Wrigley Jr. Co., Chicago, Ill.

National Technical Information Service

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Program Manager,
Office of Government Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-419,637. PREPARATION OF AN ENTOMOPATHOGENIC FUNGAL INSECT CONTROL AGENT.

SN 6-473,395. RUNNING SKYINE INTERMEDIATE SUPPORT AND MULTI-SPAN CARRIAGE.

SN 6-473,396. PREPARATION OF ESTERS OF RESIN ACIDS, RESINS, ROSINS, AND DERIVATIVES THEREOF.

SN 6-473,478. BIOLOGICAL PROCESS FOR REDUCING ENERGY REQUIREMENT FOR POST REFINING OF PULPS.

SN 6-474,996. NOVEL DIOLEFIN PHEROMONE MIMICS AS DISRUPTANTS OF SEXUAL COMMUNICATION IN INSECTS.

SN 6-475,784. METHOD FOR REDUCING SODIUM CONTENT AND SIMULTANEOUSLY INCREASING POTASSIUM CONTENT OF A FOOD.

SN 6-491,151. A VAPOR PROCESS FOR MINERAL DYEING CELLULOSIC FABRICS.

SN 6-496,687. SYNTHETIC PHEROMONE FOR THE SPINED SOLDIER BUG, *PODISUS MACULIVENTRIS.*

SN 6-506,482. METHOD FOR OBTAINING A PURIFIED FRACTION FROM A MIXTURE USING A MAGNETIC FLUID.

DEPARTMENT OF THE AIR FORCE

SN 6-171,614 (4,387,989). COHERENT OPTICAL FEATURE IDENTIFIER APPARATUS.

SN 6-192,406 (4,387,971). DYNAMIC DAMPING SYSTEM.

SN 6-200,226 (4,390,816). SCAN CORRECTED VIDICON CAMERA APPARATUS.

SN 6-216,103 (4,388,614). AUTOMATICALLY SEQUENCED SIGNALING SYSTEM.

SN 6-225,556 (4,387,344). PHOTON STORAGE TUBE HIGH POWER LASER SYSTEM.

SN 6-231,074 (4,387,955). HOLOGRAPHIC REFLECTIVE GRATING MULTIPLEXER/DEMULTIPLEXER.

SN 6-239,955 (4,390,854). BROAD BANDWIDTH SURFACE ACOUSTIC WAVE FILTER APPARATUS WITH STAGGERED TUNING.

SN 6-286,817 (4,387,467). SATELLITE TEST CHAMBER WITH ELECTROMAGNETIC REFLECTION AND RESONANCE DAMPING FOR SIMULATING SYSTEM GENERATED ELECTROMAGNETIC PULSES.

SN 6-308,976 (4,387,962). CORROSION RESISTANT LASER MIRROR HEAT EXCHANGER.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-508,323. GENETIC REASSORTMENT OF ROTAVIRUSES FOR PRODUCTION OF VACCINES AND VACCINE PRECURSORS.

SN 6-509,819. METHOD OF JOINING PLASTIC OPTICAL FIBERS AND CONNECTIONS OBTAINED.

DEPARTMENT OF THE INTERIOR

SN 6-324,173. METHOD FOR SOLDERING ALUMINUM AND MAGNESIUM.

PATENT NOTICES

Certificates of Correction for the Week of Sept. 13, 1983

D. 257,780	4,363,678	4,386,087	4,390,570
D. 266,585	4,366,032	4,386,214	4,390,638
Re. 30,361	4,367,458	4,386,308	4,390,667
3,950,379	4,368,105	4,386,314	4,390,678
4,046,798	4,370,679	4,386,865	4,390,734
4,101,307	4,373,127	4,386,941	4,390,873
4,213,455	4,373,692	4,387,039	4,391,545
4,237,584	4,374,831	4,387,770	4,391,568
4,246,044	4,376,298	4,387,852	4,391,598
4,256,894	4,378,394	4,388,539	4,391,622
4,263,317	4,378,633	4,388,581	4,391,924
4,263,576	4,378,655	4,388,634	4,392,191
4,288,506	4,379,134	4,388,750	4,392,243
4,290,164	4,379,237	4,388,795	4,392,315
4,320,779	4,379,334	4,388,946	4,392,505
4,324,404	4,380,825	4,389,229	4,392,675
4,343,479	4,380,887	4,389,521	4,392,693
4,344,977	4,381,390	4,389,623	4,392,853
4,345,071	4,381,398	4,389,751	4,393,084
4,348,552	4,381,499	4,389,864	4,393,471
4,353,855	4,382,329	4,389,882	4,394,063
4,354,345	4,382,967	4,389,888	4,394,293
4,354,368	4,383,645	4,390,096	4,395,005
4,358,820	4,384,718	4,390,146	
4,359,742	4,385,363	4,390,432	
4,360,965	4,385,904	4,390,498	

Disclaimers

3,655,201.—*Larry D. Nichols,* Arlington, Mass. PATTERN FORMING PUZZLE AND METHOD WITH PIECES ROTATABLE IN GROUPS. Patent dated Apr. 11, 1972. Disclaimer filed Apr. 25, 1983, by the assignee, *Moleculon Research Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,194,815.—*Wayne E. Trombley,* Midland Mich. SEMI-SCLERAL CONTACT LENS. Patent dated Mar. 25, 1980. Disclaimer filed July 28, 1983, by the assignee, *Dow Corning Corp.*

Hereby enters this disclaimer to all claims of said patent.

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1

[Docket No. 30725-143]

Proposed Revision of Patent Practice

AGENCY: Patent and Trademark Office, Commerce

ACTION: Notice of proposed rulemaking.

SUMMARY: The Patent and Trademark Office proposes to amend the rules of practice in patent cases, Part 1 of 37 CFR, to clarify the practice under certain sections of Public Law 97-247 of 1982 and to make certain other changes and clarifications in practice which have been found desirable after some experience. The changes proposed would change the practice under §§1.27 and 1.28 with regard to subsequently establishing small entity status and qualifying for a refund of fees paid in full. The proposed changes in other rules are intended to clarify and improve the practice in certain areas.

DATES: Comments must be submitted on or before October 18, 1983; a public hearing will be held on October 18, 1983, 9:30 a.m.; requests to present oral testimony should be received on or before October 11, 1983.

ADDRESS: Address written comments and requests to present oral testimony to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, Attention: R. Franklin Burnett, Room 3-11A13. The hearing will be held in Room 6-1215, on the 12th floor of Building 6, Crystal Plaza, located at 2221 Jefferson Davis Highway, Arlington, Virginia. Written comments and a transcript of the public hearing will be available for public inspection in Room 11A13 of Building 3, Crystal Plaza at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: This proposed rule change is designed primarily to 1) clarify the small entity status of independent inventors, small business concerns and nonprofit organizations having funding agreements with a federal governmental agency as defined in 35 U.S.C. 202(c)(4); 2) rewrite §1.28 to provide a system for obtaining a refund of a portion of a fee paid in full when small entity status is established within two months of the date of such payment; 3) provide that a separate statement establishing small entity status is not required in an application filed under §1.62 when such status has been established in the parent application; and 4) modify certain other rules to clarify practice.

Proposed new §1.21(l) would establish a fee for processing and retaining any application which is abandoned for failing to

complete the application pursuant to §1.53(d). This proposed new paragraph, as well as the proposed changes to §§1.53 and 1.78, would indicate that in order to obtain benefit of a prior U.S. application, either the basic filing fee or the processing and retention fee of §1.21(l) must be paid. Proposed §1.53(d) would further establish that the application will be disposed of if the required fee is not paid within a set period. Proposed §1.56(b) would require submission of copies of foreign patent documents, non-patent publications, or other non-patent items of information disclosed pursuant to the duty to disclose. Proposed new §1.191(d) would clarify that §§1.136 or 1.550(c) apply to all time periods set forth in §§1.191-1.194, 1.196 and 1.197.

DISCUSSION OF SPECIFIC RULES:

Section 1.5, paragraph (a), if amended as proposed, would remove a reference to §1.55, which is no longer appropriate.

Section 1.6, if amended as proposed, would clarify the manner in which letters and papers which are filed in accordance with §1.10 by "Express Mail" are date stamped when received in the Patent and Trademark Office. Such letters and papers, which comply with §1.10, will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or federal holidays within the District of Columbia.

Section 1.14, if amended as proposed, would revise paragraph (b) to clarify that only complete patent applications as defined in §1.51(a) which become abandoned will be retained for a period of twenty years from the filing date. Incomplete applications will be retained as provided in proposed §§1.21 and 1.53.

Section 1.19, paragraph (b)(3), if amended as proposed, would clarify that only copies made from Office records, but not prepared by the Office, will be compared with the original prior to certification of the copies. The Office will not compare copies made from some other copy or record with Office records for purposes of certification. The stated charge of ten cents per page would not be sufficient to make a word-by-word comparison. The requirements of the public appear to still be served by limiting the use of the comparison fee to Office records.

Section 1.21, if amended as proposed, would revise paragraph (b)(2) and establish a new paragraph (l). The change in paragraph (b)(2) is in accord with the proposed change in §1.25(a). Proposed new paragraph (l) provides a fee for processing and retaining any application which is abandoned pursuant to §1.53(d). Such applications have received a filing date pursuant to 35 U.S.C. 111 but have been abandoned for failure to complete the application by filing the oath or declaration, filing fee or surcharge (§1.16(e)). The proposed fee would cover the handling, filming, processing, data input and

storage required to retain an application. The proposed fee would not be due in any application in which the basic filing fee was paid.

Section 1.25, if amended as proposed, would revise paragraph (a) to set the minimum deposit for a deposit account at $1000 and to clarify that an amount sufficient to cover all fees as well as services, copies, etc., requested must always be on deposit. This minimum amount is considered necessary and proper in view of the substantial increase in the amounts of fees being charged to deposit accounts and the processing costs of handling these accounts. Proposed paragraph (b) would clarify that fees may be charged against a deposit account only where sufficient funds are on deposit to cover the entire amount of the fees. Proposed paragraph (b) would also clarify that an authorization to charge a fee to a deposit account will not be considered payment on the date the authorization to charge is effective as to that fee unless sufficient funds are present in the account to cover the fee.

Section 1.27, if amended as proposed, would revise paragraphs (b), (c) and (d) to provide clearly that an independent inventor, small business concern, or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a federal agency pursuant to 35 U.S.C. 202(c)(4). Section 1.27 is proposed to be amended to state that such a license does not constitute a license or a conveyance of rights which would preclude qualifying for small entity status. The amendment is necessary for clarification and to avoid frustrating the intent of Public Law 97-247 and Public Law 96-517 when taken together.

The text of title 35, United States Code, §202(c)(4) reads as follows:

> §202. Disposition of rights
>
> (c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:
>
> * * *
>
> (4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

Section 1.28, if amended as proposed, would revise paragraph (a) to clarify that a separate verified statement is not required to be filed in a file wrapper continuing application filed pursuant to §1.62, if status as a small entity has been established in the

parent application and is still proper. Proposed §1.28(a) would also permit a refund of a fee timely paid in the full amount if within two months of the date of the full timely payment: (1) small entity status is properly established, and (2) a refund is requested. Under proposed §1.28(a), no request for a refund filed later than two months after the date on which a full fee has been paid will be entertained. Proposed §1.28(a) would provide for, in somewhat modified form, the practice presently in effect pursuant to a waiver of §1.28 published at 1023 O.G. 77 on October 26, 1982 and extended at 1027 O.G. 115 on February 15, 1983.

The revised refund procedures in proposed §1.28(a) would apply to any fees timely paid in full on or after the effective date of the final rule. The refund procedures set forth in the Patent and Trademark Office Official Gazette Notice entitled "Filing of Verified Statements Claiming Small Entity Status" published at 1023 O.G. 77 on October 26, 1982, and the Official Gazette Notice entitled "Requirement for Filing Verified Statements Claiming Small Entity Status" published at 1027 O.G. 115 on February 15, 1983, continue in effect until the effective date of the final rule or until other action is taken.

Section 1.52(d), if amended as proposed, would clarify that the verified English translation of a non-English language application and the fee set forth in §1.17(k) can be filed with the application or within such time as may be set by the Office.

Section 1.53, paragraphs (b) and (d), if amended as proposed, would clarify in paragraph (b) that the application for patent must be filed in the name of the actual inventor or inventors by giving all their names as required by §1.41. Proposed paragraph 1.53(d) would state that if a correspondence address is provided, notice would be provided where the appropriate filing fee or oath or declaration do not accompany the application. Proposed paragraph 1.53(d) would also provide that if the required filing fee is not paid, or the processing and retention fee is not paid, within one year of the date of mailing of notification pursuant to proposed paragraph 1.53(d), the application will be disposed of. The proposed paragraph wording would further indicate that no copies will be provided or certified by the Office of an application which has been disposed of or in which neither the basic filing fee nor the processing fee has been paid. Finally, proposed paragraph 1.53(d) would specify that if no correspondence address is included in the application, applicant will have two months from the filing date to file the fee, oath or declaration and to pay the surcharge set forth in §1.16(e) in order to prevent abandonment of the application.

Section 1.55, paragraph (b), if amended as proposed, would correct an error in referring to paragraph (a) of this section.

Section 1.56, if amended as proposed, would revise paragraph (b) and add a new paragraph (j). Proposed paragraph 1.56(b) would require that a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form being disclosed pursuant to §1.56 accompany such disclosures. Proposed paragraph 1.56(b) would also add "or her"

to refer to both genders. Proposed new paragraph 1.56(j) would state that applicant would be notified if a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form is not submitted and given a time period within which to file the copy or state that the copy is not in the possession of the person making the disclosure. Such a time period would be extendable under §1.136. Failure to respond in a proper and timely manner would result in abandonment of the application.

Section 1.59, if amended as proposed, would clarify that the Office will furnish copies of papers received in the Office at the usual cost only if the basic filing fee or the processing and retention fee has been paid.

Section 1.60, if amended as proposed, would break the section into paragraph (a) and new paragraph (b). Paragraph (a) would add a reference to proposed amended §1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. Proposed new paragraph 1.60(b) would provide that the signing of the oath or declaration could be omitted if the prior application was complete as set forth in §1.51(a). Proposed new paragraph 1.60(b) also requires that a true copy of the prior complete application be filed. Proposed paragraph 1.60(b) would also provide that only amendments reducing the number of claims or adding a reference to the prior application will be entered before calculating the filing fee and granting the filing date.

Section 1.62, if amended as proposed, would revise paragraphs (a) and (d). Proposed paragraph 1.62(a) would provide that the file wrapper continuing procedure is applicable only to prior complete applications under §1.51(a). Proposed paragraph 1.62(d) would clarify that the filing fee referred to is the basic filing fee.

Section 1.78, if amended as proposed, would change the title to more explicitly define the contents of the section and proposed paragraph (a). Proposed paragraph 1.78(a) would specify that in order for an application to claim the benefit of a prior filed copending national application, the prior application must be complete as set forth in §1.51(a) or be entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16, or be entitled to a filing date as set forth in §1.53(b) and have paid the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d).

Section 1.121, if amended as proposed, would revise paragraph (e) to specify how amendments to the description and claims are to be made in reissue applications.

Section 1.123, if amended as proposed, would clarify that the paper requesting amendments to the drawing should be a separate paper.

Section 1.135 is proposed to be amended by removing paragraph (d) since it is not necessary in view of the ability to obtain extensions of time under §1.136(a) by petition and payment of fee.

Section 1.136, if amended as proposed, would clarify in paragraphs (a) and (b) that the extension of time practice under this section does not apply in interference proceedings or in reexamination proceedings. Extension of time practice in interference proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.245. Extension of time practice in reexamination proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.550(c).

Section 1.191, if amended as proposed, would add a new paragraph (d) to provide that the time periods for appeal and review set forth in §§1.191-1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

Section 1.192, if amended as proposed, would revise paragraph (a) to delete the reference to §1.136 since it is provided for in proposed new §1.191(d).

Section 1.197, if amended as proposed, would revise paragraph (b) to delete the reference to §1.136 since it is provided for in proposed new §1.191(d).

Section 1.304, if amended as proposed, would clarify that extensions of time periods set forth therein are subject to the provisions of §1.245 for interferences or §1.550(c) where reexamination proceedings are involved rather than to §1.136 which applies in all other cases.

Section 1.550, if amended as proposed, would revise paragraph (c) to clarify that the time for taking any action, including appeal, by a patent owner in a reexamination proceeding is governed solely by this section.

Section 1.555, if amended as proposed, would revise paragraphs (a) and (b). Proposed paragraph 1.555(a) would change "prior art" statement to --information disclosure-- statement to conform to the language of §1.98. Proposed paragraph 1.555(b) would require that disclosures pursuant to this paragraph be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Environmental, energy, and other considerations: The proposed rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq.

The rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354). Public Laws 96-517 and 97-247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et. seq., since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to filing of small entity statements in applications filed under §1.62 will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations, Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations as set forth below.

It is proposed to amend 37 CFR, Part 1, as follows with deletions indicated by brackets and additions by arrows.

1. Section 1.5 is proposed to be amended by revising paragraph (a) to read as follows:

§1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit and name of the examiner to which it has been assigned [(see §1.55)].

* * * * *

2. Section 1.6 is proposed to be amended by revising paragraph (a) to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt ▶ except where such letters and papers are filed in accordance with §1.10. Any such letters and papers filed in accordance with §1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of

Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia ◀. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

* * * * *

3. Section 1.14 is proposed to be amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to §1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. [Abandoned] ▶ Complete ◀ applications ▶ (§1.51(a)) which are abandoned ◀ may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

4. Section 1.19 is proposed to be amended by revising paragraph (b)(3) to read as follows:

§1.19 Document supply fees.

* * * * *

(b) * * *

(3) For comparing copies ▶, made from Patent and Trademark Office records but ◀ not prepared by the ▶ Patent and Trademark ◀ Office ▶, ◀ with the original, prior to certification of the copies, per page.....$ 0.10

* * * * *

5. Section 1.21 is proposed to be amended by revising paragraph (b)(2) and by adding a new paragraph (l) to read as follows:

§1.21 Miscellaneous fees and charges.

* * * * *

(b) * * *

(2) Service charge for each month when the balance at the end of the month is below [$40] ▶$1000◀..$ 2.00

* * * * *

▶(1) For processing and retaining any application abandoned pursuant to §1.53(d) unless the required basic filing fee has been paid..... $100.00.◀

6. Section 1.25 is proposed to be revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of [$50] ▶ $1000 ◀ or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all ▶ fees, ◀ services, copies, etc., requested must always be on deposit. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $[40] ▶ 1000 ◀ .

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts ▶ if sufficient funds are on deposit to cover such fees ◀ . A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account ▶ containing sufficient funds ◀ may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. ▶ An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee. ◀

7. Section 1.27 is proposed to be amended by revising paragraphs (b), (c) and (d) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47 of this part, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity.

Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status. ▶ For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part. ◀

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. ▶ For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part. ◀

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) of this part specifying under which one of §1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. ▶ For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph. ◀

8. Section 1.28 is proposed to be amended by revising paragraph (a) to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee [(1)] precludes payment

of the fee in the amount established for small entities [; and (2) precludes a refund pursuant to §1.26 of this part of any portions of fees paid prior to establishing status as a small entity]. ▶ A refund pursuant to §1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under §1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. ◀ Status as a small entity is waived for any fee by the failure to establish the status prior to paying, [or] at the time of paying ▶, or within two months of the date of payment of, ◀ the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under §1.60 ▶ or §1.62 ◀ of this part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 of this part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except those filed under §1.60 ▶ or §1.62 ◀ of this part. Applications filed under §1.60 ▶ or §1.62 ◀ of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

* * * * *

9. Section 1.52 is proposed to be amended by revising paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(d) An application [including a signed oath or declaration] may be filed in a language other than English [if it is accompanied by the fee set forth in §1.17(k)]. A verified English translation of the non-English language application [is] ▶ and the fee set forth in §1.17(k) are ◀ required to be filed with the application or within such time as may be set by the Office.

10. Section 1.53 is proposed to be amended by revising paragraphs (b) and (d) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and

Trademark Office ▶ in the name of the actual inventor or inventors as required by §1.41 ◀ . No new matter may be introduced into an application after its filing date (§1.118).

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified ▶, if a correspondence address has been provided, ◀ and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. ▶ If the required filing fee is not timely paid, or if the processing and retention fee set forth in §1.21(l) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. ◀ The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. ▶ If no correspondence address is included in the application, applicant has two months from the filing date to file the fee, oath or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. ◀

* * * * *

11. Section 1.55 is proposed to be amended by revising paragraph (b) to read as follows:

§1.55 Claim for foreign priority.

* * * * *

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his ▶ or her ◀ attorney or agent, when submitting a claim for such right as specified in paragraph ▶ (a) ◀ [(b)] of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

12. Section 1.56 is proposed to be amended by revising paragraph (b) and by adding a new paragraph (j) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(b) Disclosures pursuant to this section ▶ must be accompanied by a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed and ◀ may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his ▶or her◀ own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

* * * * *

▶(j) If any disclosure pursuant to this section does not include a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed, applicant will be so notified and given a period of time within which to file the copy or state that the copy is not in the possession of the person making the disclosure. The time period set may be extended under §1.136.◀

13. Section 1.59 is proposed to be revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost ▶ of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(l)) has been paid ◀.

14. Section 1.60 is proposed to be revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

▶(a)◀ A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 ▶ and §1.78(a) ◀), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application. [Signing and execution of the application papers by the applicant may be omitted provided the copy is supplied by and accompanied by a statement by, the applicant or his or her attorney or agent that the application papers comprise a true copy of the prior application as filed. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be

entered before calculating the filing fee and granting the filing date.]

▶(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a) and (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.◀

15. Section 1.62 is proposed to be amended by revising paragraphs (a) and (d) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification ▶ , ◀ [and] drawings ▶ and oath or declaration ◀ from a prior ▶ complete ◀ application ▶ (§1.51(a)) ◀ to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on [a] ▶ the ◀ prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior ▶ complete ◀ application.

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate ▶ basic ◀ filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

* * * * *

16. Section 1.78 is proposed to be amended by revising the title and paragraph (a) to read as follows:

§1.78 ▶ Claiming benefit of earlier filing date and cross-references ◀ [Cross-references] to other applications.

(a) [When an applicant files an] ▶ An ◀ application ▶ may claim ◀ [claiming] an invention disclosed in ▶ the same applicant's ◀ [a] prior filed copending national application or international application designating the United States of America [of the same applicant,] ▶ . In order for an application to claim the benefit of a prior filed copending national application, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application ◀ [the second application] must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications [, if the benefit of the filing date of such prior application is to be claimed]. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

17. Section 1.121 is proposed to be amended by revising paragraph (e) to read as follows:

§1.121 Manner of making amendments.

* * * * *

(e) In reissue applications, both the descriptive portion and the claims are to be amended [as specified in paragraph (a) of this section.] ▶by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See §1.173.◀

* * * * *

18. Section 1.123 is proposed to be revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the

examiner[. The paper requesting amendments to the drawing] ▶ and ◀ should be ▶ a ◀ separate ▶ paper ◀ [from other papers].

19. Section 1.135 is proposed to be amended by removing paragraph (d).

§1.135 Abandonment for failure to respond within time period.

* * * * *

[(d) Prompt ratification or filing of a correctly signed copy may be accepted in case of an unsigned or improperly signed paper. (See §1.7.)]

20. Section 1.136 is proposed to be revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. ▶ See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings. ◀

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings ▶ and §1.550(c) for extension of time in reexamination proceedings ◀ .

21. Section 1.191 is proposed to be amended by adding a new paragraph (d) to read as follows:

§1.191 Appeal to Board of Appeals.

* * * * *

▶ (d) The time periods set forth in §§1.191 through 1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.◀

22. Section 1.192 is proposed to be amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved. [The time periods set forth herein are subject to the provisions of §1.136.]

* * * * *

23. Section 1.197 is proposed to be amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states. [Such time may be extended under the provisions of §1.136.]

* * * * *

24. Section 1.304 is proposed to be amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to §1.197(b) or §1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of §1.136 ▶ or §1.550(c) as to decisions of the Board of Appeals, or §1.245 as to decisions of the Board of Patent Interferences ◀ .

* * * * *

25. Section 1.550 is proposed to be amended by revising paragraph (c) to read as follows:

§1.550 Conduct of reexamination proceedings.

* * * * *

(c) The time for ▶ taking any action by a patent owner in a reexamination proceeding ◀ [reply set in paragraph (b) of this section] will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.

* * * * *

26. Section 1.555 is proposed to be amended by revising paragraphs (a) and (b) to read as follows:

§1.555 Duty of disclosure in reexamination proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. All such individuals who are aware, or become aware, of patents or printed publications material to the reexamination which have not been previously made of record in the patent file must bring such patents or printed publications to the attention of the Office. ▶ An information disclosure ◀ [A prior art] statement, preferably in accordance with §1.98, should be filed within two months of the date of the order for reexamination, or as soon thereafter as possible in order to bring such patents or printed publications to the attention of the Office.

(b) Disclosures pursuant to this section ▶ must be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and ◀ may be made to the Office through an attorney or agent having responsibility on behalf of the patent owner for the reexamination proceeding or through a patent owner acting in his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the reexamination.

* * * * *

JUL 22 1983

Date

Gerald J. Mossinghoff
Commissioner of Patents and Trademarks

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Kadiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

SEPTEMBER 13, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

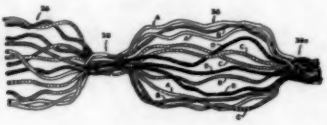
Re. 31,376
YARN STRUCTURE AND METHOD FOR PRODUCING SAME

Richard W. Sheehan; David B. Parlin; Harry F. Jamrogowicz, all of Greenville, and John A. Patterson, Abbeville, all of S.C., assignors to Bigelow-Sanford, Inc., Greenville, S.C.

Original No. 3,846,968, dated Nov. 12, 1974, Ser. No. 368,875, Jun. 11, 1973. Application for reissue Jan. 12, 1981, Ser. No. 224,461

Int. Cl.³ D02G *3/34, 3/24, 3/12, 1/16*

U.S. Cl. 57—208 **9 Claims**



1. A continuous yarn structure comprising at least one *air jet entangled* yarn element formed from a plurality of fibers, said yarn structure comprising lengths of high bulk, substantially un-entangled yarn element fibers alternating with lengths of compacted yarn element fibers in which substantially all fibers are mutually entangled throughout the volume of the compacted *yarn* lengths, *at least some of the yarn element fibers each having a cross-sectional area in certain portions of the yarn differing in size from that in other portions of said yarn so that* at least some of the individual fibers have a lesser cross-sectional area in the final yarn structure than [in their unprocessed lengths] *prior to being air entangled.*

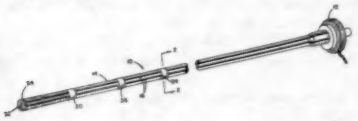
Re. 31,377
DISPOSABLE ESOPHAGEAL AND TRACHEAL MULTI-PROBES

Kenneth C. Mylrea, Tucson, Ariz., and Joseph Demer, Baltimore, Md., assignors to University Patents, Inc., Norwalk, Conn.

Original No. 4,176,660, dated Dec. 4, 1979, Ser. No. 885,173, Mar. 10, 1978. Application for reissue Nov. 28, 1980, Ser. No. 210,901

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—642 **6 Claims**



1. A disposable [*esophageal*] *probe comprising a flexible plastic tube having proximal and distal portions and an unobstructed lumen, said tube adapted to be inserted into a patient's mouth and then into either* the esophagus *or the trachea;*

a plurality of conductive pathways longitudinally embedded in the wall of said plastic tube, said pathways having substantially similar flexibility to said plastic tube and being insulated from each other and the patient by the plastic of said tube;

a least a pair of conductive bands encircling said tube's distal portion, each band making contact with at least one embedded conductive pathway and being adapted to receive ECG signals and

a connector plug mounted on the proximal portion of said plastic tube, said connector plug having a plurality of sharp metal connecting pins which pierce and electrically connect to said conductive pathways, said plug further having an unobstructed lumen which mates with the lumen of said tube.

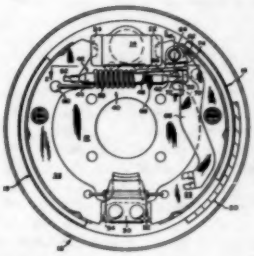
Re. 31,378
DRUM BRAKE ADJUSTER

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Original No. 4,101,011, dated Jul. 18, 1978, Ser. No. 791,667, Apr. 28, 1977. Application for reissue Aug. 15, 1980, Ser. No. 178,274

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—79.5 GT **8 Claims**



1. An adjustment mechanism for a drum brake having a hydraulic actuator cooperating with a pair of brake shoes to urge the latter into engagement with a rotatable member for effectuating braking, said adjustment mechanism comprising:

an extendible member engaging the pair of brake shoes, said extendible member being extendible to dispose the pair of brake shoes adjacent but slightly spaced from the rotatable member;

a pawl pivotally mounted on one of the brake shoes, said pawl engaging said extendible member to provide for extension of the extendible member when the pawl pivots relative to the one brake shoe; and

a resilient member extending from the other brake shoe to said pawl, said resilient member cooperating with the one brake shoe via the pivotal mounting with said pawl and the other brake shoe to bias the pair of brake shoes into engagement with the hydraulic actuator [and], said resilient member [also] cooperating with said pawl to pivot said pawl relative to the one brake shoe, *and said resilient member also cooperating with said pawl to bias said pawl into abutting engagement with said extendible member to bias said extendible member away from the one brake shoe and into engagement with the other brake shoe and said pawl being pivoted about the abutting engagement with said extendible member by said resilient member in order to retract the one brake shoe away from the rotatable member upon termination of braking.*

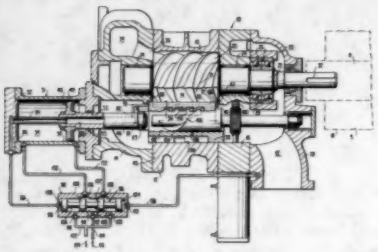
Re. 31,379
COMBINED PRESSURE MATCHING AND CAPACITY CONTROL SLIDE VALVE ASSEMBLY FOR HELICAL SCREW ROTARY MACHINE

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Original No. 4,222,716, dated Sep. 16, 1980, Ser. No. 44,433, Jun. 1, 1979. Application for reissue Oct. 16, 1980, Ser. No. 197,401

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—310 **5 Claims**



5. In a positive displacement helical screw rotary machine functioning either as a compressor or an expander and including a casing provided with a barrel portion defined by intersecting bores with coplanar axes located between axially spaced end walls and having inlet and outlet ports in communication with the bores at opposite ends, helical screw rotors, each having grooves and lands and being mounted for rotation within respective bores with lands and bores of respective rotors intermeshed, an axially extending recess provided within the barrel portion of the casing in open communication with said bores, and a slide valve member mounted for axial sliding within the recess with at least a portion of the interface of the slide valve member being complementary to the envelope of that portion of the bores of the casing structure confronted by the opening of the recess and with the slide valve member communicating the bore portion of the casing structure with the slide valve member in sealing relation with the confronting rotor structure, the outlet port having at least a portion located in the barrel portion of the casing structure, with the slide valve member being movable between extreme positions in which the outlet port is open and closed, said slide valve member being of sufficient length to cover the entire remaining length of the confronting portion of the rotor structure throughout the range of movement of said slide valve member between extreme positions, pressure sensing means provided adjacent to the end of the slide valve member closing off the outlet port to the closed thread for sensing the pressure of the working fluid within the closed thread just upstream from the outlet port, means for comparing the pressure of the outlet port to the closed thread pressure at the outlet port, and means for automatically shifting the slide valve member axially to equalize these pressures to prevent undercompression or overcompression of the working fluid when the unit is functioning as a compressor and for preventing underexpansion or overexpansion of the working fluid when the unit is functioning as an expander to maximize machine efficiency in respective modes, the improvement comprising:

an arcuate opening within said slide valve member,

an arcuate volumetric capacity control valve body slidably and sealably fitting said arcuate opening within said slide valve member,

means including said arcuate volumetric capacity control valve body for communicating the inlet port of said machine to said working chamber bearing the intermeshed helical screw rotors,

means responsive to shifting of the valve body relative to the slide valve member for varying communication between said inlet port of said machine and said working chamber, and

means for effecting controlled movement of said valve body relative to said slide valve member for varying the capacity of said positive displacement helical screw rotary machine.

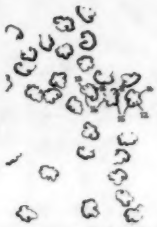
Re. 31,380
RAYON FIBERS CONTAINING STARCH

Frederick R. Smith, Toms Brook, Va., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Original No. 4,144,079, dated Mar. 13, 1979, Ser. No. 811,793, Jun. 30, 1977. Continuation-in-part of Ser. No. 696,451, Jun. 15, 1976, abandoned, and a continuation-in-part of Ser. No. 629,952, Nov. 7, 1975, abandoned. Application for reissue Sep. 23, 1980, Ser. No. 189,870

Int. Cl.³ C08L *1/24;* **D01F** *2/08*

U.S. Cl. 106—164 **19 Claims**



29. Process for preparing starch-containing rayon fiber which comprises forming a slurry of starch granules in aqueous medium, adding an aqueous solution of a starch-splitting agent active in alkaline medium to said slurry, the proportion being about 0.003 by 0.015 moles of agent per mole of starch in slurry, adding sodium hyroxide (NaOH) to said slurry to produce an aqueous alkaline solution of starch, blending said solution with viscose, extruding the starch-containing viscose in fiber form and regenerating the cellulose in the extruded viscose to form starch-containing regenerated cellulose fibers, said starch having an amylopectin content of at least 60%.

Re. 31,381
PROCESS FOR THE PREPARATION OF PROPYLENE OXIDE

Günter Prescher; Gerd Schreyer, both of Hanau; Otto Weiberg, Neu-Isenburg; Rolf Wirthwein, Hanau; Helmut Waldmann, Leverkusen; Hermann Seifert, Cologne; Wulf Schwerdtel, Leverkusen, and Wolf Swodenk, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold-und Silber-Scheideanstalt, Frankfurt am Main, both of, Fed. Rep. of Germany

Original No. 4,137,242, dated Jan. 30, 1979, Ser. No. 678,823, Apr. 28, 1976. Application for reissue Feb. 14, 1980, Ser. No. 121,604

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519297

Int. Cl.³ C07D *301/14*

U.S. Cl. 549—526 **32 Claims**

1. Process for the continuous production of propylene oxide from propylene and aqueous hydrogen peroxide which comprises:

(a) contacting aqueous hydrogen peroxide with propionic acid for reaction of hydrogen peroxide and propionic acid to form perpropionic acid, in the presence of a water-soluble acid catalyst for the reaction, the amount of water, catalyst and hydrogen peroxide corresponding to an aqueous solution of catalyst and hydrogen peroxide containing 10 to 40% by weight of catalyst and 20 to 30% by weight of hydrogen peroxide, and the molar ratio of hydrogen peroxide to propionic acid being 3.5 to 5:1, at a temperature of 10° to 70° C.;

(b) extracting the resulting reaction mixture with benzene

for formation of benzene phase rich in perpropionic acid, propionic acid, and containing hydrogen peroxide, and aqueous raffinate phase rich in hydrogen peroxide and catalyst[.];

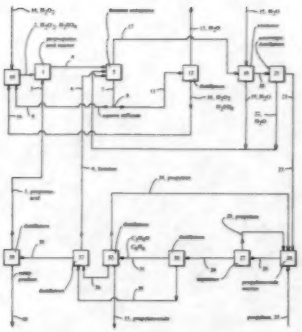
(c) treating at least part of the aqueous raffinate to remove water therefrom and form a concentrated solution of hydrogen peroxide and catalyst[.];

(d) recycling said concentrated solution of hydrogen peroxide and catalyst to step (a)[.];

(e) extracting the benzene phase of step (b) with water for formation of a benzene phase containing perpropionic acid, propionic acid, water and a reduced amount of hydrogen peroxide, and an aqueous phase containing hydrogen peroxide[.];

(f) subjecting the benzene phase produced in step (e) to azeotropic distillation to reduce the water content thereof to less than 0.5% by weight[.];

(g) contacting the benzene phase of reduced water content of step (f) with propylene at a temperature of 40° to 100° C. and a pressure of 2 to 30 bars for reaction of perpropionic acid of the benzene phase with propylene to form propylene oxide and a reaction mixture containing the propylene oxide, and other materials[.];



(h) distilling the reaction mixture to distill overhead propylene, propylene oxide and benzene and removing bottoms comprising benzene and propionic acid;

(i) subjecting the overhead from step (h) to a second distillation to distill off overhead propylene and recycling said propylene to step (g);

(j) introducing the bottoms consisting essentially of propionic acid and benzene from the distillation of step [(i) to] *(h) and benzene from the distillation of step (i) into* a third distillation *column* and distilling off overhead benzene and recycling said benzene to step (b)[.];

(k) removing bottoms from said third distillation *column* consisting essentially of propionic acid and materials of higher boiling point than propionic acid and introducing said bottoms into a fourth distillation *column* and distilling over propionic acid and recycling said propionic acid to step (a) and separating bottoms consisting essentially of the material of higher boiling point than propionic acid[.]; and

(l) recovering propylene oxide as a side cut from said second distillation.

Re. 31,382

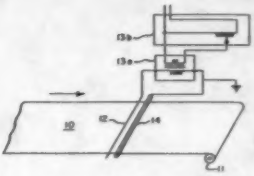
STATIC CHARGE NEUTRALIZER AND PROCESS

Edward J. Moore, Florence, S.C., and John E. Owens, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 4,110,810, dated Aug. 29, 1978, Ser. No. 776,231, Mar. 10, 1977. Application for reissue Apr. 13, 1981, Ser. No. 253,807

Int. Cl.³ H05F *3/04*

U.S. Cl. 361—213 **13 Claims**



1. A web winding device for a dielectric web material comprising:

a driven winding roll onto which the web is wound;

a nip roll in pressure contact with the web wound on the winding roll and at which pressure contact the web is first laid onto the winding roll;

a conductive bare wire less than 0.03 cm in diameter extending across and parallel with the web and located 0.6 to 8 cm from the web on the winding roll in an arc of 0° to 90° after contact by the web with the winding roll; and

means for impressing an AC voltage on the wire of 3000 to 10,000 volts at 40 to 70 Hertz.

Re. 31,383

ANTILOCKING CONTROL SYSTEM

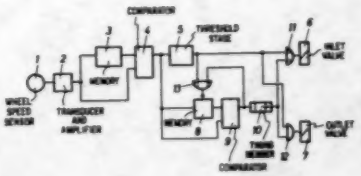
Heinz Leiber, Leimen; Jürgen Gerstenmeier, Ngm.-Waldhilsbach, and Wolfgang Korasiak, Ketsch, all of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Original No. 4,077,675, dated Mar. 7, 1978, Ser. No. 747,685, Dec. 6, 1976. Application for reissue Mar. 4, 1980, Ser. No. 127,261

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555005

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **27 Claims**



1. In an antilocking control system composed of at least one sensor connected to measure the speed of a vehicle wheel equipped with a brake and to produce a signal representative of the current wheel speed, an evaluation circuit connected to receive the signal from the sensor and generate a primary control signal, and a brake pressure control device connected to respond to the primary control signal to effect a variation in the brake pressure applied to the wheel brake in a manner to prevent the wheel from locking, the evaluation circuit acting to produce the primary control signal when the wheel speed decreases at greater than a predetermined rate, the improve-

ment comprising signal deriving means including: wheel speed variation monitoring means connected for comparing the values, at successive instants, of a parameter dependent on wheel speed, and for producing at least one wheel speed tendency signal based on such comparison; and signal processing means connected for producing selected supplemental control signals influencing the brake pressure in a predetermined manner, in response to the appearance of such a speed tendency indication wherein said variation monitoring means are arranged to produce a wheel speed increase tendency signal in response to a parameter value comparison indicating a tendency of the wheel speed to increase, said signal processing means are arranged to produce a first supplemental control signal serving to prevent brake pressure reduction in response to the presence of the wheel speed increase tendency signal, and said signal processing means are arranged to cause the first supplemental control signal to have an influence serving to maintain the brake pressure constant.

PLANT PATENTS

GRANTED SEPTEMBER 13, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,101

MINIATURE ROSE PLANT—SCHANBIRAN VARIETY

Earnest Schwartz, deceased, late of Kingsville, Md. (by Hazel E. Schwartz, executrix), assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Oct. 21, 1981, Ser. No. 313,663

Claims priority, application Netherlands, Oct. 22, 1980, ROO 1034

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the Miniature Class, substantially as herein shown and described, characterized particularly by a vigorous growth habit, the common formation of an attractive single bloom per stem having a distinctive pink and white tonality, and the formation of dark green foliage which covers the plant well having above average resistance to common garden diseases.

5,102

Patent Not Issued For This Number

5,103

PEACH TREE

Thomas O. Chamberlin, Sr., Visalia, Calif., assignor to H. P. Metzler & Sons, Inc., Del Rey, Calif.

Filed Nov. 23, 1981, Ser. No. 323,982

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described and which is characterized by its freestone fruit having a dark red color with bright yellow flesh of very firm and crisp character with a skin which is tenacious to the flesh and which ripens for picking in the last week of August and after the patented O'Henry peach.

5,104

PLANT OF THE CACTACEAE PLANT FAMILY

Barnell L. Cobia, and Robert L. Cobia, both of Winter Garden, Fla., assignors to B. L. Cobia, Inc., Winter Garden, Fla.

Filed Apr. 21, 1982, Ser. No. 370,554

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct plant variety of the Cactaceae family as shown and described and which is distinguished by the following combination of characteristics:

1. An erect growth habit,
2. A bloom with perianth tube forming tepals that have an axially oriented crease that extends proximally from the distal end of the tepal, and
3. A bloom with perianth tube forming and laminating tepals that in the marginal blade areas are dominated by colors with a yellow hue.

PATENTS

GRANTED SEP. 13, 1983

ERRATA

For CLASS	See PATENT NO.
604–070	4,403,609
604–061	4,403,610
604–073	4,403,611
139–102	4,403,630
192–058	4,403,757
425–589	4,403,810
254–275	4,403,845
052–309	4,403,980
057–298	4,404,003
148–011	4,404,025
501–139	4,404,029
210–138	4,404,093
548–423	4,404,139
423–035	4,404,169
521–029	4,404,346

PATENTS

GRANTED SEPTEMBER 13, 1983

GENERAL AND MECHANICAL

4,403,353
ANTERIOR CHAMBER IMPLANT LENS
Jerald L. Tennant, 806 Greentree La., Duncanville, Tex. 75116
Filed Jun. 25, 1981, Ser. No. 277,250
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **8 Claims**

1. An intraocular implant unit for installation and immobilization in a circularly bounded chamber of an eye of a patient comprising:

a lens disposed in a first plane for insertion within the chamber of the eye;

a limb integral with and extending outward from a margin portion of said lens to a second plane for placement within the chamber of the eye, said second plane being spaced apart from said first plane;

means extending from said limb and lying in said second plane for engaging a first portion of the chamber to thereby minimize torsional movement of said lens in the chamber;

a flexible strand having a first end connected to said lens in said first plane and a second end lying in said second plane; and

an elongated arcuate portion extending from said flexible strand second end and lying in said second plane for engaging a second portion of the chamber approximately opposite said first portion of the chamber, said elongated arcuate portion being disposed approximately opposite said means extending from said limb, and said flexible strand being doubly folded in a third plane approximately common to said first end of said flexible strand and to the ends of said elongated portion to flex in said third plane between said flexible strand first end and said elongated arcuate portion for varying the distance between said lens and said elongated arcuate portion, such that said elongated arcuate portion may engage said second portion of the chamber, said doubly folded portion not being engageable with eye tissue defining the chamber to thereby adjust the intraocular implant unit to the size of the chamber at a position between said second portion of the chamber and said lens and immobilize the implant unit in the chamber.

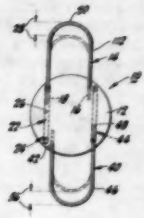
4,403,354
INTRAOCULAR LENS HAVING A FIXATION MECHANISM
Edgar A. Rainin, 2260 Gladstone Dr. #3, Pittsburgh, Calif. 94565
Continuation of Ser. No. 54,953, Jul. 5, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,420
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **13 Claims**

1. An intraocular lens having a fixation mechanism comprising:

a. a lens portion;

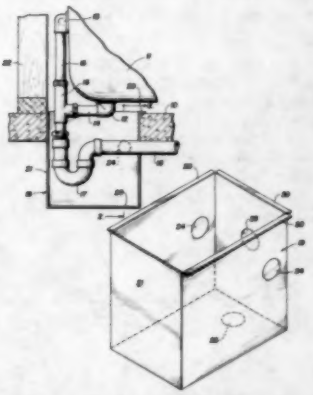
b. a flexible appendage having one end portion, another end portion, and an intermediate portion between said one and another end portions, said flexible appendage being fixed to said lens portion at said one end portion; and

c. means for slidably engaging the other end portion of said



flexible appendage to said lens portion, said intermediate appendage portion between said one end portion and said another end portion adapted to extend to the periphery of the iris.

4,403,355
BATHTUB DRAIN ENCLOSURE
William T. Petty, Rutherford, Tenn., assignor to Elbert L. Petty; Lloyd F. Petty, both of Rutherford and Robert M. Petty, Kenton, all of, Tenn.
Continuation-in-part of Ser. No. 175,580, Aug. 5, 1980, Pat. No. 4,338,688. This application Jun. 23, 1982, Ser. No. 390,999
Int. Cl.³ E03D *11/00*
U.S. Cl. 4—191 **1 Claim**



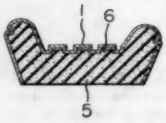
1. An enclosure for tub drains adapted for mounting in a floor opening adjacent to a tub drain into which opening the tub drain projects, said enclosure comprising a rectangular open top metal box having vertical side walls which extend through the floor opening and a horizontal bottom wall disposed at an elevation substantially below the floor opening and floor, said enclosure forming a protected dry compartment for tub drain components including a drain trap, a rising vertical drain pipe connected with one end of the trap and a downstream horizontal drain pipe connected with and leading away from said trap, narrow marginal horizontal support flanges for said enclosure at the top thereof and at least on three contiguous side walls of the enclosure, said flanges being adapted to

rest directly on a horizontal floor surface surrounding said floor opening to thereby form the sole support for the enclosure on the floor and within the floor opening, a single vertical axis knock-out disc in the horizontal bottom wall of the enclosure near one side wall thereof and remotely spaced from the opposing side wall and spaced substantially midway between the other opposing side walls of the enclosure, and three additional knock-out discs on three vertical side walls of the enclosure at a common elevation above said bottom wall, one pair of said side wall knock-out discs being axially aligned across the enclosure and having their common axis in a substantially vertical common plane with the axis of the bottom wall knock-out disc, and the third side wall knock-out disc being provided on the side wall of the enclosure nearest to said common vertical plane and being located midway between the pair of side walls having the knock-out discs on a common axis.

4,403,356
SEAT CUSHIONS

Muneharu Urai, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Oct. 30, 1980, Ser. No. 202,346
Claims priority, application Japan, Nov. 13, 1979, 54-146034
Int. Cl.³ A47C *27/16, 27/14*
U.S. Cl. 5—481 **9 Claims**

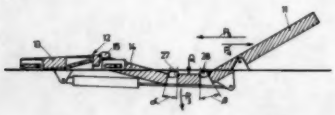


1. A seat cushion comprising a seat surface covering including a seating portion of fabric material shaped to conform to a required surface configuration and seat side portions joined to said seating portion, and a mass of cushion providing material bonded by a bonding agent to said seating portion of said seat surface covering at a plurality of distributed points.

4,403,357
RECLINING FURNITURE

Hugo Degen, Seltisberg, Switzerland, assignor to Inpaver AG, Zug, Switzerland

Filed Nov. 18, 1980, Ser. No. 207,843
Claims priority, application Switzerland, Nov. 28, 1979, 10590/79
Int. Cl.³ A61G *7/00*
U.S. Cl. 5—66 **6 Claims**

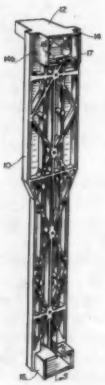


1. An article of reclining furniture comprising:
(a) a frame and an under-mattress movably mounted on the frame,
(b) the under-mattress including a back member, a foot member, a thigh member and an intermediate member,
(c) the pivotable back member having an inner end portion, an outer end portion, and a horizontal pivot axis between said end portions,
(d) the foot member being pivotable about a horizontal axis and mounted for displacement in the frame longitudinally of the article and being pivotally connected to one end of the thigh member,
(e) the intermediate member being connected to the inner end portion of the back member with a pivot joint and to an adjacent inner end portion of the thigh member with another pivot joint at the end of the thigh member opposite the pivotal connection to the foot member, and
(f) the pivot joints have horizontal pivot axes and freely suspend the intermediate member from said two inner end portions respectively so that the intermediate member is freely responsive to the positions of the back member and the thigh member.

4,403,358
END BAR

Ralph Burgin, West Point, Iowa, and Timothy C. Dadant, Hamilton, Ill., assignors to Dadant & Sons, Inc., Hamilton, Ill.

Filed Dec. 8, 1981, Ser. No. 328,602
Int. Cl.³ A01K *47/02*
U.S. Cl. 6—10 **1 Claim**



1. An end bar for a bee foundation frame that includes
(a) an upper rectangular socket which has about the same interior cross sectional area and configuration as the cross sectional area and configuration of the top cross bar that is to be inserted in the socket, and
(b) a lower rectangular socket which has about the same interior cross sectional area and configuration as the cross sectional area and configuration of the bottom cross bar that is to be inserted in the socket,
the improvement which comprises
(1) the lower horizontal portion of the upper socket and the upper horizontal portion of the lower socket each consisting of two sections that are spaced apart so as to leave an elongated opening between the inner facing edges thereof,
(2) each of the two facing sections of each socket being provided with a locking projection on the inner surface thereof in a position immediately adjacent to said elongated opening that extends between the sections,
(3) each of said two locking projections consisting of a pyramid having three upstanding triangular sides including a vertical backside that is aligned perpendicular to said elongated opening, an inner side that is parallel to and aligned with said elongated opening, and a sloping side which slopes toward the rear of the socket and upwardly from the section on which it is mounted,
whereby, when the end of a cross bar is inserted into one of said sockets and pressed inwardly over and past the sloping sides of said locking projections, the cross bar will be held in said socket by said locking projections.

4,403,359

METHOD FOR WASHING OUT THICKENING FROM PRINTED TEXTILE MATERIALS IN WEB FORM

Johannes Kutz, Tönisvorst, Fed. Rep. of Germany, assignor to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,151

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026349

Int. Cl.³ D06B 5/08, 15/04, 21/00

U.S. Cl. 8—149.1 4 Claims

1. A method for washing out thickening from printed textile material in web form, comprising: applying a foam which contains in its foam-forming liquid, particularly water, only a wetting agent and optionally a foaming agent to the printed side of the textile material; working the foam into the textile material; steaming the textile material; applying a washing fluid to the backside of the textile material; and applying suction to the printed side of the textile material to remove said washing fluid.

4,403,360

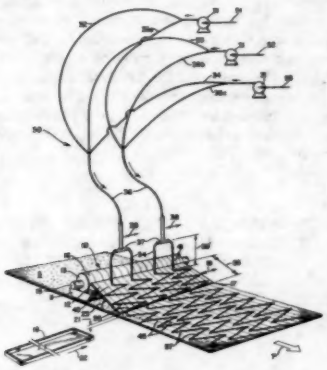
DISTRIBUTOR FOR GEL SYSTEMS TO FORM SHARPLY DELINEATED COLOR PATTERNS UPON TEXTILE SURFACES

Michael L. Finney, Charlotte, N.C.; Danny Moates, Cohutta, Ga., and Michael R. Brown, Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,480

Int. Cl.³ D06B 1/06, 11/00

U.S. Cl. 8—151 4 Claims



1. A method for continuously forming an off-carpet multi-gel pattern, before delivery thereof to a continuously moving carpet, and for forming a sharply delineated color pattern on flat, textured, or fiber-pile carpet surfaces, substantially without dyestuff migration that causes secondary and tertiary coloration, said process comprising:

A. forming a gel blanket on an inclined slide having a smooth surface and a selected angle of inclination;

B. forming a mixture of colorant gels, said gel blanket and said colorant gels being selected from the group consisting of immiscible gels and immobilized gels;

C. dropping said mixture onto said blanket through a selected drop height of approximately 1 inch to 10 inches to form said off-carpet multi-gel pattern upon said slide having a sliding length of approximately 10 inches to 25 inches;

D. selectively and individually oscillating said mixture during said dropping;

E. selectively oscillating said blanket during said dropping to form said off-carpet multi-gel pattern;

F. viewing and judging said multi-gel pattern on said slide, said off-carpet multi-gel pattern being discarded until said pattern is judged to be substantially perfect; and

G. delivering said multi-gel pattern onto said carpet through a selected delivery height to form said sharply delineated color pattern on said carpet.

4,403,361

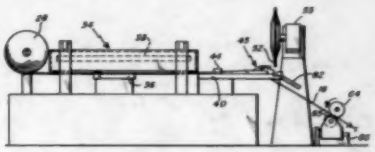
TECHNIQUES FOR STRIPPING A SLEEVE FROM RESIN IMPREGNATED FIBROUS ROVINGS

Raymond M. Bowler, Salem, N.H., and Jules N. Allard, Tyngsboro, Mass., assignors to Bush Universal, Inc., Woburn, Mass.

Filed Feb. 20, 1981, Ser. No. 236,570

Int. Cl.³ A63D 9/00

U.S. Cl. 12—142 R 10 Claims



1. A method for stripping an encasing sleeve from resin-impregnated fiber rovings comprising:

preheating the material to decrease the viscosity of the resin;

passing the sleeve over a separator tube while passing the fiber rovings through the separator tube, the separator tube having a generally circular, ring-like inlet whereby the rovings are confined into a generally circular, cross-sectional configuration and the sleeve is spread to a generally circular cross-sectional configuration;

slitting the sleeve at a location downstream of the inlet to the separator tube and then separating the sleeve from the roving by drawing the sleeve in a different direction than that of the roving;

said drawing of said slit sleeve comprising the sole means for advancing the material.

4,403,362

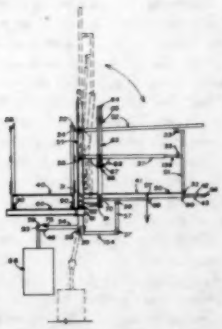
BULK LOADING FACILITY HAVING A DROP WAY

Richard Durrant, 315 London Rd., Sarnia, Ontario, Canada

Filed Jan. 2, 1981, Ser. No. 222,007

Int. Cl.³ E01D 1/00

U.S. Cl. 14—71.1 34 Claims



1. Improvement in a bulk loading facility having a fixed deck having a drop way projecting from and hinged to said deck so that it can be raised or lowered for loading, said drop way

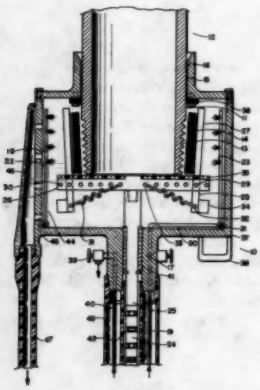
having an extendible deck slideably supoorted from and attached to the outboard end thereof, said drop way having a handrail assembly, said improvement comprising means for operating the extendible deck including a lever type mechanism having a hand lever and a locking mechanism, said lever having a fulcrum affixed to said handrail assembly, the lower end of said lever being affixed to said deck for actuating same, said locking mechanism being operative upon release of said lever to lock said deck in position.

4,403,363

PIPE THREAD CLEANER

John L. Hess, Rte. 1 Box 87B-4, Carencro, La. 70520

Filed Sep. 4, 1980, Ser. No. 184,081
Int. Cl.[3] B08B 9/02
U.S. Cl. 15—104.04 9 Claims



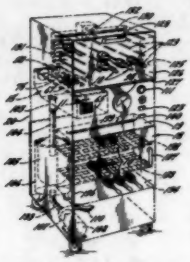
1. An apparatus for cleaning thread on a pipe comprising a portable housing for positioning over an end of said pipe; said housing having a first end and a second end with said first end having an opening for receiving the pipe end and pipe threads; said housing including a rotatable rigid shaft mounted to the second end concentrically with the opening in the first end, a plurality of radial arms of said rigid shaft positioned around its periphery, an aperture in each of said radial arms suitable for receiving a pivot pin, a pivot pin mounted in the aperture of each radial arm, brushes positioned radially with respect to the pipe threads and pivotally mounted on said pivot pins so as to allow movement of said brushes between a position of contact with the threads and a position of no contact, a spring attached to each of said brushes and to its respective radial arm so as to cause said brushes to lose contact with said threads when said rigid shaft is not rotating, and a weight attached to each of said brushes so as to cause, when said rigid shaft is rotated, a centrifugal force sufficient to overcome said spring to thereby force said brushes into contact with said threads; a flexible shaft exterior of said housing for driving said rigid shaft; motor means for driving said flexible shaft; said motor means being remote from said housing such that movement of said housing does not require the movement of said motor means; said housing including means for supplying cleaning fluid to said threads; and said housing further including means for recovering substantially all of said cleaning fluid.

4,403,364

AUTOMATIC BRUSH CLEANER

Robert W. Schroeder, Bensenville, Ill., assignor to RoMark Technology, Inc., Itasca, Ill.

Filed Jan. 21, 1982, Ser. No. 341,272
Int. Cl.[3] A46B 13/04
U.S. Cl. 15—4 18 Claims



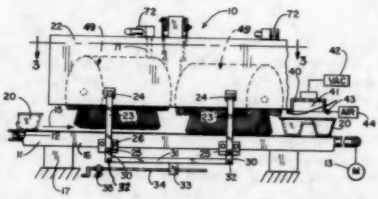
1. In an apparatus for cleaning brushes, the combination of, a carrier member adaped to releasably support and carry a brush to be cleaned, drive mechanism operable to move said carrier member and the supported brush along a predetermined path, said carrier member being turnable about the line of said path as the carrier member moves along the path, a cleaning member disposed along said path for engagement with the bristles of a brush supported by said carrier member and rotatable about an axis generally paralleling said line, power means for rotating said cleaning member, and means disposed along said path and engageable with one of said members, said means being operable to position said one member whereby the bristles of the brush face said cleaning member as the carrier member approaches the latter and to oscillate said one member and hence to oscillate the brush relative to the cleaning member as the bristles of the brush are engaged by the cleaning member.

4,403,365

BRUSH ASSEMBLY FOR CLEANING BREAD PANS

Douglas R. Hanson, 1720-9th Ave. South, Anoka, Minn. 55303

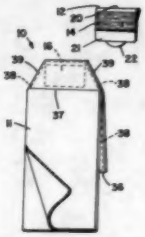
Filed Sep. 28, 1981, Ser. No. 306,215
Int. Cl.[3] A47L 15/39; A46B 13/02
U.S. Cl. 15—56 11 Claims



1. A cleaning apparatus for a pan to be cleaned, and wherein such pan is movable by a conveyor, said cleaning apparatus comprising a frame, said pan to be cleaned being moved generally in a plane along said frame from a first end to a second end, at least one brush means mounted on said frame and having elongated bristles extending outwardly in position to engage a pan moving along the plane, means to rotate said brush means about an axis so that the bristles engage a pan moving in the plane and move material from a pan, and power means to oscillate the brush means toward and away from a pan being moved in the plane at the same time as the brush means rotates,

said means to oscillate causing the bristles to be moved in longitudinal direction so the ends of the bristles are moved against the pan intermittently as the brush means rotates.

4,403,366
TOWEL AND MOUNTING METHOD AND MEANS
Harold J. Lucke, 930 Crestview Dr., Millbrae, Calif. 94030
Filed Sep. 15, 1981, Ser. No. 302,676
Int. Cl.³ A44B *21/00*; A47K *10/02*
U.S. Cl. 15—209 R **2 Claims**



1. A removable towel means for mounting on the clothing, accessories or the like of a user comprising in combination:

(a) a support member comprising a thin flat plate member made of solid material and formed into a U-shaped clip having a bight portion and converging legs in side view adapted to be mounted on said clothing, accessories or the like of said user against removal by manual forces exerted thereon in outward and downward directions only;

(b) a gripping means rigidly affixed to the exterior surface of one of said legs of said support member and including a fabric backing strip having a plurality of exposed flexible hooking elements on the free side thereof projecting from said support member when said support member is mounted on the clothing, accessories or the like of the user,

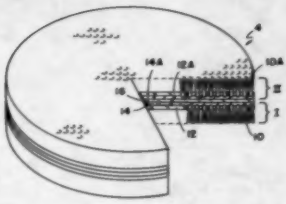
(c) a length of toweling having side and end edges including an integral packet formed therein, and

(d) a receiver means rigidly affixed to said length of toweling and including a fabric backing strip having a plurality of flexible loop elements on the free side thereof adapted to receive and hold said plurality of flexible hooking elements of said gripping means when applied thereto under manual pressure, said gripping means being adapted to be disengaged from said receiving means by manual pulling in outward and downward direction,

(e) wherein a gripping means including a plurality of projecting flexible hooking elements is affixed to one interior surface of said integral pocket adjacent the opening thereof and a receiving means including a plurality of flexible loop elements adapted to receive said hooking elements is affixed to the other interior surface of said integral pocket in opposition to said gripping means.

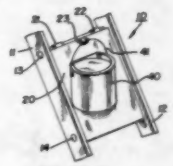
4,403,367
YARN PAD
Robert S. Brown, and John H. O'Neill, Jr., both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.
Filed Aug. 17, 1981, Ser. No. 293,723
Int. Cl.³ B24D *13/14, 13/20*
U.S. Cl. 15—230.12 **12 Claims**

1. A circular yarn pad having two composite layers for use on a floor cleaning machine, each of said layers comprising a flat primary substrate material, a plurality of yarn segments having a major proportion of each segment protruding from a first face of said primary substrate material in fixed relation thereto, a secondary backing material secured to a second face of said primary backing material, said second face being opposite from said first face, wherein said layers are securely joined with said backing materials in opposed relation and said first



faces of said substrate materials directed in mutually opposite directions.

4,403,368
PAINT CAN SUPPORT FOR LADDERS
Orville R. Harper, 1410 6th Ave., Neptune, N.J. 07753
Filed Feb. 10, 1982, Ser. No. 347,573
Int. Cl.³ B44D *3/14*
U.S. Cl. 15—257 R **6 Claims**



1. A paint pail holder for a ladder having a given spacing between the sides of said ladder, and a given spacing between the rungs of said ladder; said paint pail holder comprising a rigid support sheet; said support sheet being narrower than said given spacing between the sides of said ladder, and being longer than said given spacing between the rungs of said ladder; at least one hook extending from the upper rear of said support sheet to hook over one of the rungs of said ladder; a trapezoidal section cut out of the central portion of said support sheet to fit between said sides and two adjacent rungs of said ladder; said trapezoidal section having a base portion equal in length to the diameter of a given pail of paint; said trapezoidal section having a heigth equal to the height of said given pail of paint; and said trapezoidal section having a top portion of less length than that of said base portion; to accomodate and hold said given pail, rigid within said trapezoidal section, at an angle with respect to said support sheet, in a horizontal plane.

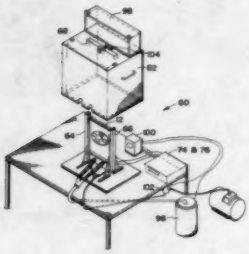
4,403,369
INTERNAL CADDY CLEANING APPARATUS
Peter T. Lin, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Oct. 26, 1981, Ser. No. 314,906
Int. Cl.³ A47L *5/14*
U.S. Cl. 15—304 **10 Claims**

1. An apparatus for cleaning an enclosure formed by a pair of spaced panels defining an edge opening in communication with a cavity comprising:

(A) a housing for receiving said enclosure;

(B) means in communication with the external surfaces of said panels for causing excitation thereof;

(C) means coupled to said edge opening for directing a jet of pressurized fluid into said cavity; and



(D) means subject to engagement with said edge opening for connecting said cavity to a vacuum chamber for removing dislodged foreign matter from said cavity.

4,403,370

ARRANGEMENT FOR CLEANING BAND-LIKE DATA CARRIERS

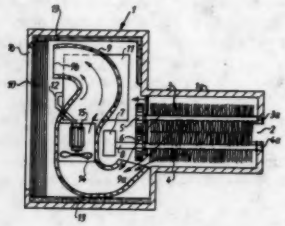
Heinz Rapp, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 295,093

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033315

Int. Cl.³ A47L *9/28*

U.S. Cl. 15—308 8 Claims



1. An arrangement for cleaning band-shaped data carriers, particularly photographic films, comprising at least one brush element arranged to move relative to a data carrier so as to remove dirt particles from the latter; aspirating means for aspirating the thus removed particles; a high frequency electric motor driving said aspirating means and having a frequency which is a multiple of that of an electric network; a frequency amplifier arranged to connect said electric motor with the electric network; and an S-shaped tubular member having a central portion, said aspirating means and said high-frequency electric motor being located in said central portion of said S-shaped tubular member.

4,403,371

DEBRIS COLLECTING DEVICE

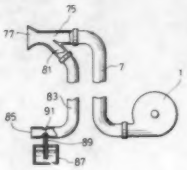
Katsumi Kiyooka, Warabishi, Japan, assignor to Komatsu Zenoah Co., Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,513

Claims priority, application Japan, May 7, 1980, 55-059282; May 7, 1980, 55-059481; May 7, 1980, 55-061450[U]; May 7, 1980, 55-061451[U]; May 7, 1980, 55-061452[U]; May 7, 1980, 55-061453[U]; Jun. 13, 1980, 55-079109; Jun. 13, 1980, 55-081650[U]; Jun. 13, 1980, 55-081651[U]; Jun. 30, 1980, 55-090643[U]; Aug. 9, 1980, 55-079110; Aug. 9, 1980, 55-108822[U]

Int. Cl.³ A47L *5/18*

U.S. Cl. 15—328 1 Claim



1. In a debris collecting device of the type having a portable air blower unit, a blower conduit connected for directing the air stream from said blower to an air stream passage, and a debris intake conduit connected to said air stream passage such that air in said debris intake is entrained by said air stream in said air stream conduit whereby debris may be lifted from a ground surface into said intake conduit, said air stream passage having an exhaust end to which may be removably attached a debris collecting container, the improvement comprising an injection port for connection with a source of chemicals, said port opening into said debris intake conduit for injecting chemicals into said air stream, such that said debris collecting device may be converted to a chemical applicator upon removal of said collecting container.

4,403,372

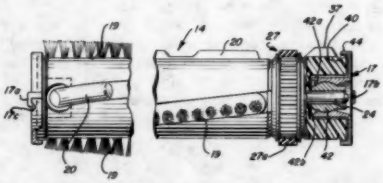
VACUUM CLEANER BRUSH HAVING STRING GUARD MEANS

James W. Keane, White Bear Lake, and Erwin E. Nordeen, St. Paul, both of Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 22, 1982, Ser. No. 351,233

Int. Cl.³ A47L *9/00*

U.S. Cl. 15—339 17 Claims



1. In a vacuum cleaner brush having a cylindrical support carrying brush tufts and defining longitudinally opposite ends, and bearing means at said opposite ends for journaling the support for rotation about its longitudinal axis, the improvement comprising

a string guard at said opposite ends for preventing movement of string on said support outwardly to said bearing means, said string guard means comprising means at said ends defining spaces wherein string received therein has a lower energy level than that of string adjacent thereto whereby the tendency of string picked up by the rotating

brush to seek the lowest available energy level causes the string to be effectively captured in said spaces.

4,403,373

HINGE FITTING FOR FOLDABLE LADDERS

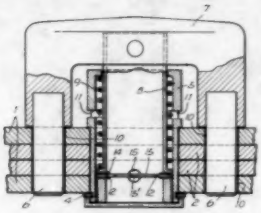
Walter Kümmerlin, In den Fressackern 6, D-7120 Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,555

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005692; Feb. 15, 1980, 3005693

Int. Cl.³ E05D *11/10*

U.S. Cl. 16—327 **22 Claims**



1. In a hinge fitting for foldable ladders, having two fitting parts connected with each other in flange regions of said fitting parts by a hollow hinge pin and having a locking device which comprises at least one locking bolt, mounted for swinging parallel to the hinge axis and movable by means of a handle from an interlocking position into an unlocked position and openings formed in the flange regions of the fitting parts, said at least one locking bolt being insertable into the openings in predetermined angular positions of the fitting parts relative to each other, at least one of said openings is connected with a slot in one of said flange regions which extends from said one opening over a path which is concentric to the hinge axis, the improvement wherein

the width of said slot measured in radial direction is less than the width measured in radial direction of the opening which is connected with the slot,

the locking bolt has a constriction in a section thereof, in the interlocking position said constriction is at least partially longitudinally outside the openings of the two flange regions and is alignable by a longitudinal displacement of the locking bolt with said one flange region with the slot, said constriction having a shape which permits a relative movement within the slot in longitudinal direction of the slot.

4,403,374

MEANS FOR CONTROLLING DENSITY OF NON-WOVEN FIBER WEBS

Dennis E. Wood, Fairport, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,521

Int. Cl.³ D01G *15/40*

U.S. Cl. 19—105 **9 Claims**

1. Apparatus for forming a non-woven fiber mat, comprising

a fiber feed chute having in its upper end a surge section for receiving air-borne fibers from a supply thereof, and in its lower end a formation section for forming fibers into a predetermined configuration,

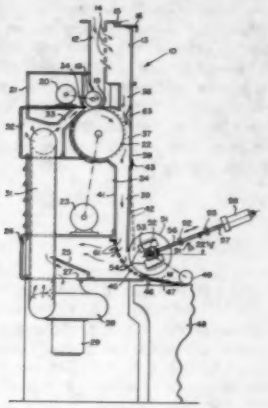
means intermediate the ends of said chute for feeding fibers downwardly from said surge section to said formation section,

a metering roll mounted to rotate adjacent the lower end of said chute, and for limited reciprocable movement transversely thereof,

a stationary condenser mounted beneath an opening in the lower end of said chute and having thereon a concave surface extending beneath said roll to form therewith a nip which communicates with said opening in the chute,

said roll being operative during rotation thereof to draw fibers from said chute and to compress them into a non-woven mat as they pass through said nip and between said roll and the concave surface on said condenser,

sensing means for monitoring the density of the fiber mat passing between said roll and said condenser, and



means for adjusting the density of said mat when said density differs from a predetermined value,

said adjusting means including means for positively moving said roll toward said condenser, when said mat density falls below said predetermined value, and to move said roll away from said condenser, when said mat density exceeds said predetermined value.

4,403,375

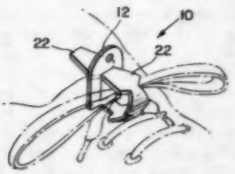
TYING DEVICE

Ronald D. Blum, 838 Orchard Rd. SW., Roanoke, Va. 24014

Filed Jul. 6, 1982, Ser. No. 395,621

Int. Cl.³ F16G *11/00*; B65D *63/00*

U.S. Cl. 24—16 PB **6 Claims**



1. A tying device comprising:

(a) a resilient, flexible material having a generally flat configuration with a base portion defining a slot therethrough and a tongue portion extending from the base portion configured for insertion into the slot;

(b) said tongue portion including two portions, an intermediate portion having a plurality of wedge portions arranged contiguous with one another, and a tail portion extending from a wedge portion distal from said base portion, said tail portion have a width less than the width of the slot defined in the base portion for facilitating insertion of the tail portion therethrough;

(c) at least one of said wedge portions defining a grasping

member extending from the surface thereof for grasping material to which said device can be secured;

(d) adjacent wedge portions being crimped therebetween to provide a tear line where the remaining portion of the tongue portion can be torn away once the device is locked in place, said wedge portion distal from said base portion is a distal wedge portion and includes a crimped portion at its juncture with the tail portion to provide a tear line where the tail portion can be torn away from the remaining portion of the device; and

(e) said wedge portions having one end with a width less than the width at the opposite end, the maximum width of said wedge portion being less than the length of the slot but greater than the slot width to permit passing of said wedge portions through the slot while preventing retraction when oriented such that the maximum width of a wedge portion engages the adjacent surfaces of the base portion defining the slot.

4,403,376

CENTRAL BELT LOCK, PARTICULARLY FOR AIRCRAFT SAFETY BELT

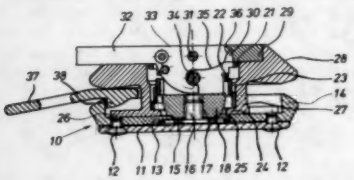
Armin Palloks, Heist, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,130

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047664

Int. Cl.³ A44B *11/25*

U.S. Cl. 24—205.17 **4 Claims**



1. A central strap lock, particularly for aircraft safety belts, for simultaneous releasable connection of a plurality of straps which have respective connection tongues which in turn are provided with respective hook-shaped connection devices, said central strap lock comprising in combination:

a lock housing having a base portion and a hook-shaped bead therearound;

a hub secured to said housing, that end of said hub secured to said housing being provided with a tapering portion, the other end of said hub comprising a cylindrical part;

a disc arranged on said hub and having a portion thereof located across from said bead of said housing, said disc being shiftable against spring action, with said tapering of said hub essentially coinciding in length with the shifting path of said disc, said disc including an opening which encircles said hub, said opening having a diameter corresponding essentially to the diameter of said cylindrical part of said hub; and

a latching device associated with said disc, said latching device including a hook-like projection that engages a portion of said hub when said latching device is moved to a horizontal position locking said tongues in place, and said latching device also being movable into at least one other position which permits insertion of said connection tongues between said disc and said housing, said disc being tiltable around said tapering of said hub during said at least one other insertion position of said latching device.

4,403,377

FASTENING DEVICE

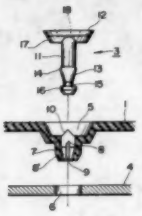
Akira Mizusawa, Fujisawa, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Dec. 15, 1980, Ser. No. 216,100

Claims priority, application Japan, Dec. 18, 1979, 54-174290[U]

Int. Cl.³ F16B *13/06*

U.S. Cl. 24—217 R **10 Claims**



1. A fastening device comprising a fastening base and a wedge member, said fastening base being provided with a radially expendable engaging leg vertically extended downwardly from the lower surface of said fastening base and adapted to be inserted into a perforated hole in a panel and with an axially converging insertion hole extending vertically along the axis of said engaging leg downwardly from the upper surface thereof to a reduced neck portion at the entering end of said leg, and said wedge member being provided with a shank portion adapted for pre-assembled insertion into said insertion hole and with a flange-shaped head portion formed at the upper end of said shank portion, whereby the fastening of said fastening base to the panel is accomplished by inserting said engaging leg into the perforated hole of the panel and then forcing said shank portion of said wedge member by further advancement into said insertion hole thereby causing said engaging leg to be initially radially expanded within the perforated hole, said wedge member shank portion further comprising an enlarged diameter leading end portion opposite to said head portion and followed by a first shank portion of reduced diameter substantially no greater than the smallest unexpanded diameter defined by said axially converging insertion hole neck portion for normally retaining said wedge member pre-assembled and non-removably engaged with and partially axially advanced with respect to said fastening base with said engaging leg in a non-expanded condition, said neck portion embracing said first shank portion with said entering end portion extending beyond said leg entering end as a pilot, and a second enlarged diameter portion following said first shank portion and followed by a second shank portion of diameter greater than said smallest unexpanded diameter of said axially converging insertion hole, said second shank portion contacting and radially expanding said engaging leg within said perforated hole upon further axial advancement of said wedge member.

4,403,378

PIPE CLAMP MEANS

Arnold B. Engman, Des Moines, Iowa, assignor to EMCO Industries, Inc., Des Moines, Iowa

Filed Dec. 7, 1981, Ser. No. 327,899

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—277 **1 Claim**

1. A clamp for securing telescopic positioned pipe sections together, comprising,

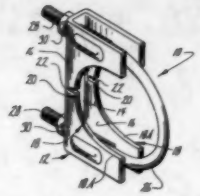
a saddle portion being U-shaped in cross-section and having a straight back portion, and opposite side portions,

each side portion having semi-circular openings adapted to engage a portion of a pipe perimeter,

a U-shaped bolt means having opposite ends and being posi-

tioned to form a pipe-receiving aperature with said semi-circular openings,

said back portion having apertures to receive the ends of said U-shaped bolt means, tightening means on the ends of said bolt means to draw said U-shaped bolt means towards said saddle portion,



a radially disposed slot having parallel opposite sides and an arcuate bottom, said slot being located at the apex of each of said semi-circular openings to facilitate the deflection of said back portion and to facilitate the conformation of said semi-circular openings to pipe sections extending through said pipe-receiving aperture as said tightening means draws said U-shaped bolt means towards said saddle portion to partially collapse said slot.

4,403,379

CHAIN FOR A TENTER FRAME WITH TENTERING CLAMPING AND NEEDLE COMBINATION LINKS

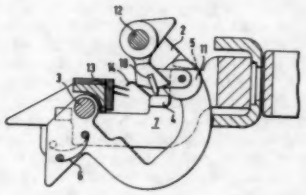
Karl Grafen, Wuerselen, Fed. Rep. of Germany, assignor to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,709

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033271

Int. Cl.³ D06C 3/04

U.S. Cl. 26—95 **5 Claims**



1. A chain structure for a tenter frame for substantially vertical chain reversal, comprising chain link means, intermediate support means (7) having a first free end and a second end secured to said chain link means, arched bail means (2), first lower journal means (3) extending below and in parallel to a margin of a fabric web for journaling a lower end of said bail means (2) to said first free end of said intermediate support means (7) for tilting said bail means between a working position and a rest position, tenter hook means (10), second upper journal means (12) extending above and in parallel to a margin of a fabric web for journaling said tenter hook means (10) to said bail means (2) at the upper free end thereof, wherein said arched bail means (2) is tiltable about said lower journal pin (3) in such a manner that a plane extending through both journal means (3, 12) intersects a fabric web at a given spacing from the respective margin of a fabric web (1), said tentering hook means (10) producing on the fabric margin a clamping line which is located within said given spacing, said chain structure further comprising needle means, needle bar means (13), for operatively supporting said needle means, said needle bar means being journaled to said first lower journal means (13) for tilting said needle bar means between an inoperative position and an operative position in which the needle penetrates a margin of a fabric web, said arched bail means (2) being tiltable into said rest position in which said plane extending through both journal means passes outside a fabric web for permitting said tilting of the needle bar means into an operative position in which said needle means penetrate a fabric web (1).

4,403,380

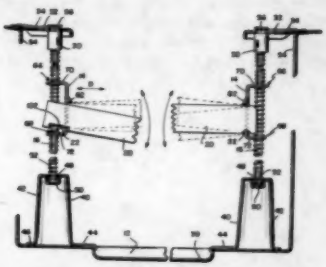
CASKET BED

David A. Hazelett; Charles B. Shaw, both of Lynn, and Paul W. McCombs, Connersville, all of Ind., assignors to Astral Industries, Inc., Lynn, Ind.

Filed Feb. 11, 1982, Ser. No. 348,094

Int. Cl.³ A61G 17/00

U.S. Cl. 27—12 **14 Claims**



1. A vertically adjustable casket bed comprising:

a pair of vertically extending, threaded rods, one rod situated at each end of the casket,

a pair of laterally extending frame ends, each frame end comprising a U-shaped channel member having a pair of apertures surrounding one of the vertically extending rods, one such aperture being situated in each leg of the U-shaped channel forming the frame end, at least one aperture directly engaging the threads of a corresponding rod, each frame end having two additional apertures situated in the bight of the U-shaped channel for receiving side members, each additional aperture including an edge protruding from the plane of the bight, and

a pair of longitudinally extending side members, the ends of each side member being lockingly received in one of the additional apertures in each frame end, at least one end of each longitudinally extending side member including means for permitting longitudinal variation of the distance between the pair of frame ends.

4,403,381

METHOD FOR THE MANUFACTURE OF LAYER CAPACITORS

Saad Almahmoud, Zeitlarn; Hubert Kraus, Regensburg, and Martin Riepl, Poikam, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,593

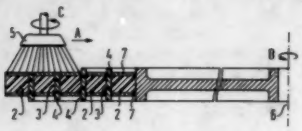
Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017507

Int. Cl.³ H01G 4/30

U.S. Cl. 29—25.42 **3 Claims**

1. In a method for the manufacture of layer capacitors which comprises winding a plurality of parent capacitors on a drum with one capacitor on top of the other, separating the parent capacitors from one another by wound-in separating layers of plastic material which protrude from face surfaces of the parent windings, completely covering the faces of the thus-formed starting capacitor with a sprayed metal layer, removing the parts protruding over the sprayed metal layers of the separating layers before dividing the thus-formed starting capacitor, opening said starting capacitor by at least one radial cut, and

dividing said starting capacitor into single parent capacitors, the improvement comprising employing as said separating layers foils of celluloseaceto-butyrate which, after the completion of the starting capacitor are brittle, at least in the regions



which protrude from the sprayed metal layer, brushing away said brittle protruding parts of the separating layers by means of a rotating cup-type brush, and removing the separating layers after the division into single parent capacitors.

4,403,382

PROCESS FOR MANUFACTURING ELECTROMECHANICAL TRANSDUCERS USING AT LEAST ONE POLYMER FILM

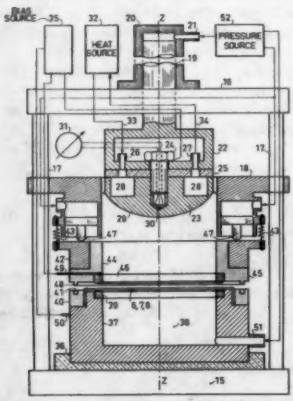
Hugues Facoetti; Patrick Petit; Philippe Menoret; Francois Micheron, and Pierre Ravinet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 2, 1981, Ser. No. 239,643

Claims priority, application France, Mar. 4, 1980, 80 04832

Int. Cl.³ H04R *17/00*

U.S. Cl. 29—25.35 **8 Claims**



1. A process for manufacturing electromechanical transducers using at least one polymer film which is subjected to shaping, said process comprising:

providing two faces of a flat structure comprising said film with similar metalizations intended to form electrodes; and

shaping said flat structure with metalizations thereon to produce a self-supporting and nondevelopable structure by applying a polarizing voltage to said metalizations while carrying out bidirectional stretching so that the mechanical stress permanently increases the surface area of the metalizations carried by said structure.

4,403,383

ELECTRICAL LEAD TRANSFER UNIT

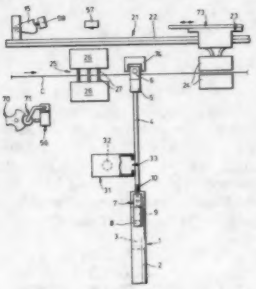
Paul E. Dewhurst, and John C. Collier, both of Southport, England, assignors to BICC PLC and Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 54,971, Jul. 5, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,529

Claims priority, application United Kingdom, Jul. 4, 1978, 28714/78; Dec. 1, 1978, 46880/78

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—33 M **10 Claims**



1. For use in transferring an electrical lead from a measuring, cutting and stripping machine having a cutting and stripping head and a clamping head movable axially of a wire to be cut into separate leads from said cutting and stripping head to a lead measuring position spaced from said cutting and stripping head to a terminating machine having a drive shaft, a transfer unit comprising

(a) a fluid-operated piston working in a cylinder;

(b) an electrical lead gripping device which is carried by the piston and which is caused to be reciprocated by the said piston in a rectilinear direction substantially parallel to the direction of motion of the said piston and transverse to the length of an electrical lead being measured, cut and stripped in the measuring, cutting and stripping machine between a first position at which the gripping device grips an electrical lead being measured, cut and stripped in the measuring, cutting and stripping machine and a second position transversely spaced therefrom at which an electrical termination can be secured by the terminating machine to a stripped end of an electrical lead carried by the gripping device while another electrical lead is being measured, cut and stripped by the measuring, cutting and stripping machine;

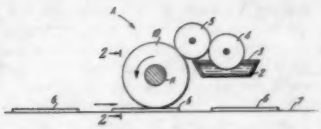
(c) means for ejecting an electrical lead from the gripping device after an electrical termination has been secured to one of the ends of the electrical lead, which automatic ejection means comprises a spring-loaded pneumatically operated piston working in a cylinder, a source of air pressure, a normally closed valve by which said source of air pressure is connected to said piston, and a cam adapted to be rotatably driven by the drive shaft of the terminating machine, which cam controls the normally closed valve and is so shaped that after a termination has been secured to an electrical lead, it opens the valve to effect the operation of the piston against the action of its spring to push the terminated electrical lead out of the gripping device; and

(d) a control system for effecting automatic reciprocation of the gripping device between said two positions and operation of the ejection means in synchronisation with the cycles of operations of the measuring, cutting and stripping machine and of the terminating machine whereby a lead is drawn through the cutting and stripping head while the lead gripping device is removed from its first position.

4,403,384
APPLICATOR FOR DIRECT ROLL COATING

Ozzie Fogle, Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 156,818, Jun. 5, 1980. This application Jan. 12, 1981, Ser. No. 223,950
Int. Cl.³ B21B *31/08*; B60B *7/04*
U.S. Cl. 29—130 4 Claims



1. An applicator for direct roll coating of a surface of a textured panel, said surface of said textured panel defining a plurality of contours, said applicator comprising:

an elongated central core member of annular cross-section;

a layer of fibrous pliable material disposed on said central core member, said layer of fibrous pliable material being of web construction and held together by a binding adhesive, said fibrous layer having a radial thickness of sufficient dimension to enable said fibrous layer to assume the contours of said textured panel without exceeding the elastic limit of said fibrous layer;

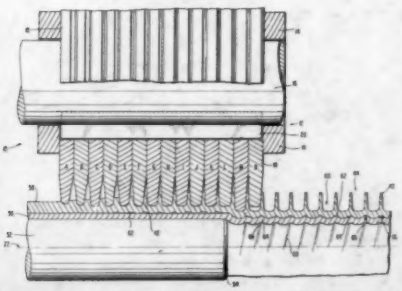
a protective tube member of pliable impervious polyethylene material disposed around said layer of fibrous web material, said tube member having a smaller radial thickness than said layer of fibrous material; and

a layer of woven material disposed over said protective tube member, said layer of woven material being of smaller radial thickness than the radial thickness of the layer of fibrous material, whereby said tube member and said layer of woven material are urged by said fibrous layer into continuous rolling contact with said contours on said surface of said textured panel.

4,403,385
PROCESS OF PREPARING A DOUBLE WALL HEAT EXCHANGER

Kenneth L. Kirk, Cranston, R.I., assignor to Amtrol Inc., West Warwick, R.I.

Division of Ser. No. 200,598, Oct. 24, 1980, Pat. No. 4,337,824. This application Jul. 7, 1981, Ser. No. 281,069
Int. Cl.³ B23P *15/26*
U.S. Cl. 29—157.3 AH 4 Claims



1. Process for forming a double wall heat exchanger which comprises:

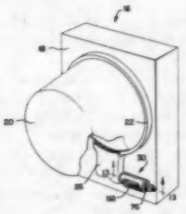
(i) placing a first ductile tube inside of a second ductile tube, the first tube tightly fitting inside of said second tube, the first tube being the inner tube and the second tube being the outer tube, and placing a mandrel inside of the first ductile tube; and

(ii) finning the combination of the outer tube and the inner tube and the inner tube in a finning apparatus, whereby a helical fin is pressure formed on the outer surface of the outer tube before the pipes reach the end of the mandrel and whereby simultaneously a continuous, small helical groove is formed on the inside surface of the outer tube which follows the path of the helical path of the helical fin, a disc of the finning apparatus, which is located beyond the end of the mandrel and which is larger in radius than the discs located over the mandrel, pushing inwardly both of the tubes after the tubes have progressed beyond the end of the mandrel, the radius of such disc being sufficiently large to provide sufficient inward pushing on the inner tube to cause the inner tube to expand and conform to the inside surface and diameter of the outer tube, whereby a slightly-raised, continuous, helical protrusion is formed which mates with the internal helical groove of the outer tube, but does not entirely fill the internal groove, a continuous helical passageway between the inner and outer tubes thereby being formed, the continuous, narrow helical passageway being unimpeded and extending from one end of the double wall heat exchanger to the other end thereof, the inner surface of the outer tube, except in the region of the inner, continuous, small helical groove thereof, contacting the outer surface of the inner tube, except in the region of the slightly-raised continuous helical protrusion thereof.

4,403,386
BOLT TYPE LOCK PULLER

Richard E. Hoyt, Worcester, Mass., assignor to Omco, Inc., Holden, Mass.

Continuation of Ser. No. 102,925, Dec. 12, 1979, abandoned. This application Sep. 1, 1981, Ser. No. 298,294
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—265 3 Claims



1. A bolt type lock puller comprising:

(a) a hollow sleeve having an open leading end and a closed trailing end in which an axially centered circular aperture is provided;

(b) an extractor mounted to axially reciprocate within said sleeve, said extractor having split jaws at its leading end, said jaws being split along an axial plane, said jaws fixed against relative rotational and axial movement with respect to each other, said jaws mounted for limited relative movement solely in a transverse direction towards and away from each other;

(c) said extractor split jaws having opposed teeth positioned to clamp around a cylindrical object;

(d) means for releasably closing said split jaws by transversely moving said jaws towards each other in a direction normal to the axis of said sleeve, said jaw closing means causing said jaws to bite into and tightly grip the head of a bolt type lock; and

(e) means for reciprocating said extractor relative to said sleeve to pull a tightly gripped bolt type lock into said sleeve, said reciprocating means including a longitudinal

stud affixed to said extractor and extending through said sleeve trailing end aperture, said longitudinal stud adapted to be acted upon to axially move said extractor within said sleeve, said longitudinal stud being externally threaded, each said split jaw being formed with a substantially semicircular axial bore, each said bore having internal threads sized to receive said externally threaded stud, said split jaws constrained for limited transverse movement and fixed against axial movement relative to said longitudinal stud, said reciprocating means being entirely separate from and operating independently of said jaw closing means;

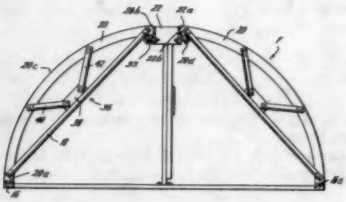
(f) said closing means moving said jaws solely in the transverse direction, and said reciprocating means moving said jaws solely in the axial direction.

4,403,387

METHOD OF MAKING FRAME FOR THE CONSTRUCTION OF HEMISPHERICAL MULTI-LAYERED SHELL

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Houston, Tex.

Filed May 11, 1981, Ser. No. 262,422
Int. Cl.³ B23P *17/00*
U.S. Cl. 29—416 **5 Claims**



1. A method for making a hemispherical frame for constructing a hemispherical multi-layered head, comprising the steps of:

machining a plurality of annular plates to a substantially equal outer diameter, which outer diameter is substantially equal to the inner diameter of the hemispherical frame to be manufactured thereon;

arranging one of the annular plates in position as a base plate;

cutting the remainder of the plates into substantially congruent arc portions of less than 90°, each of the arc portions having first and second end;

mounting a brace member to each of the arc portions;

mounting the arc portions by the first end to the upper surface of the annular base plate;

circumferentially spacing the arc portions in a radial direction, equally around the annular base plate; and

fastening the second end of each of the arc portions to a central annular collar.

4,403,388

AUTOMATIC PALLET-MAKING MACHINE AND METHOD

Roy L. Belcher, 5434-88th St. SW., Everett, Wash. 98204

Continuation-in-part of Ser. No. 131,405, Mar. 17, 1980, abandoned. This application May 11, 1981, Ser. No. 262,397
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—429 **27 Claims**

1. An automatic pallet-making machine for assembling a pallet from slats and stringers, comprising:

a movable carrier on which a pallet is automatically assembled;

a slat magazine;

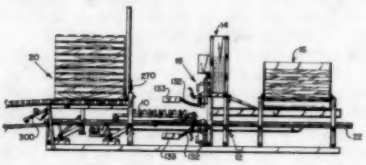
slat dispensing means for serially dispensing slats onto the carrier from the slat magazine as the carrier passes the slat magazine;

a stringer magazine;

stringer dispensing means for dispensing stringers from the stringer magazine transversely onto the slats previously dispensed onto the carrier;

fastening means for automatically fastening the slats and stringers together on the carrier to form an assembled pallet;

a track running between the slat magazine and stringer magazine upon which the carrier moves with a reciprocating motion; and means for reciprocally driving the carrier along the track so that a first series of slats are dispensed on the carrier as it moves in a forward direction to form a bottom deck for a pallet, stringers are then dispensed onto the first series of slats on the carrier by the stringer dispensing means, and a second series of slats is dispensed



onto the stringers as the carrier moves in a reverse direction past the slat magazine and slat dispensing means.

22. A method for automatically forming a double-sided pallet from slats and stringers, comprising the steps of:

serially dispensing a first plurality of slats onto a reciprocating carrier to form a lower deck of the pallet when the carrier moves in a first direction;

dispensing a plurality of stringers onto the first plurality of slats forming the lower deck of a double-sided pallet when the carrier moves in said first direction;

dispensing a second plurality of slats onto the stringers to form an upper deck when the carrier moves in a second direction; and

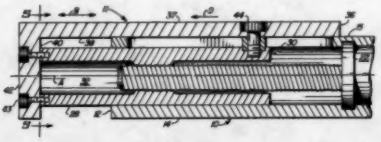
then automatically fastening the slats forming the upper and lower decks to the stringers, without flipping the partially formed pallet of slats and stringers, to form an assembled pallet.

4,403,389

SLIDE MECHANISM

Robert L. Coope, Phoenix, Ariz., assignor to Stevens Engineering, Inc., Phoenix, Ariz.

Filed Feb. 5, 1981, Ser. No. 231,896
Int. Cl.³ B23Q *1/14*
U.S. Cl. 29—561 **4 Claims**



1. A slide mechanism for stabilized rectilinear reciprocation comprising:

a. a base having a planar surface;

b. a slide element having a planar surface slidably and continuously disposed against the planar surface of said base; and

c. stabilizing means for guiding said slide element during reciprocal movement relative said base while maintaining the planar surface of said slide element in sliding contact

with the planar surface of said base, said stabilizing means comprising:

a bore formed within said base and having an axis lying in a plane parallel to the planar surface of of said base;

a shuttle slidably disposed within said bore, said shuttle having a first end and a second end;

an elongate slot communicating between the planar surface of said base and said bore and extending along an axis parallel to the axis of said bore;

a fastening element extending through said slot and interconnecting said slide element with said shuttle at said first end thereof;

an attachment element projecting from said slide element over an end of said base; and

a plurality of connecting elements for affixing said attachment element to said second end of said shuttle.

4,403,390

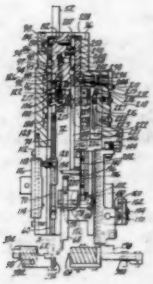
RADIAL LEAD INSERTING MACHINE

Daniel W. Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Division of Ser. No. 956,436, Oct. 31, 1978, Pat. No. 4,293,999. This application Feb. 13, 1981, Ser. No. 234,345

Int. Cl.³ H05K *13/04*

U.S. Cl. 29—564.1 **2 Claims**



1. In a machine for inserting the leads of electrical components into circuit board holes and comprising a driver reciprocable along a path toward and from the board, means for thus actuating the driver, mechanism for indexing relative to the driver path the respective components to be inserted, pairs of fingers actuatable in time relation to the driver for seizing the respective leads of an indexed component to guide them partly into selected lead-receiving board holes, and a pusher actuatable by the driver to engage each indexed component to complete the insertion of said guided lead, the improvement which comprises providing a compressible spring connection between the pusher and said driver, and means releasably locking the pusher to said driver permitting loading of said spring connection, cam means controlling said locking means and operable while said fingers are approaching the board with the seized leads to store potential energy in said connection, the cam means being arranged to release said locking means and said energy substantially when the fingers have contacted the board.

4,403,391

MACHINE TOOL INCLUDING A TOOL TRANSFER MECHANISM

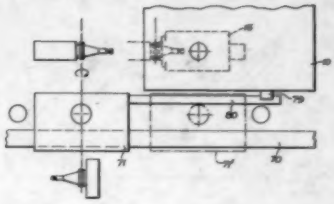
Colin J. Peacock, Long Buckby, England, assignor to De Vlieg Machine Company Ltd., Latterworth, England

Filed Apr. 8, 1981, Ser. No. 252,036

Claims priority, application United Kingdom, Apr. 15, 1980, 8012396

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **8 Claims**



1. A machine comprising:

(a) a work head adapted to mount a tool therein;

(b) means operative to move the work head in a predetermined direction;

(c) means defining a tool exchange location where tools are presented for mounting in said work head and are received after removal from said work head; and

(d) a tool transfer mechanism operative to change the tool mounted in said work head, said tool transfer mechanism including:

(i) a carriage;

(ii) means operative to move said carriage in said predetermined direction between said work head and said means defining the tool exchange location;

(iii) latch means operable to latch said carriage positively and detachably to said work head for movement with said work head in said predetermined direction, said latch means including an arm which can be extended and retracted relative to said carriage in said predetermined direction and a latch device for latching said arm to said work head; and

(iv) a pair of tool grippers carried by said carriage, one of said tool grippers being arranged to grip a tool removed from said work head during movement of said carriage from said work head to said means defining the tool exchange location, the other of said tool grippers being arranged to grip a replacement tool for mounting in said work head during movement of said carriage from said means defining the tool exchange location to said work head.

4,403,392

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Jiro Oshima; Masaharu Aoyama; Seiji Yasuda, all of Yokohama, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 22, 1980, Ser. No. 152,305

Claims priority, application Japan, Jun. 6, 1979, 54-71042

Int. Cl.³ H01L *21/225*

U.S. Cl. 29—569 R **8 Claims**

1. A method for manufacturing a semiconductor device comprising:

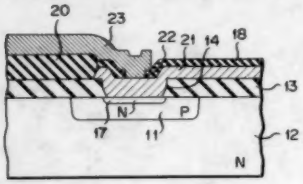
(a) forming on a semiconductor substrate an insulating layer having a diffusion window;

(b) forming an impurity-doped poly-silicon layer on the insulating layer and on that portion of the semiconductor substrate which is exposed through the diffusion window, said impurity being arsenic;

(c) forming an undoped poly-silicon layer on the impurity-doped poly-silicon layer;

(d) thermally oxidizing the substrate with the insulating layer, impurity-doped poly-silicon layer and undoped poly-silicon layer, thus diffusing the impurity from the impurity-doped poly-silicon layer into the semiconductor substrate through the diffusion window and converting the undoped poly-silicon layer to a silicon oxide layer;

(e) forming on the silicon oxide layer an oxidation-resisting mask layer in a desired pattern; and



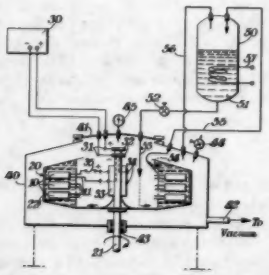
(f) thermally oxidizing the substrate with the insulating layer, impurity-doped poly-silicon layer, silicon oxide layer and mask layer, thus converting those portions of the impurity-doped poly-silicon layer which lie beneath those portions of the silicon oxide layer which are exposed through the mask layer to impurity-doped silicon oxide layers, whereby the remaining portions of the impurity-doped poly-silicon layer provide an interconnection electrode layer having a desired pattern.

4,403,393

ACCELERATED AGING-IMPREGNATION OF ELECTROLYTIC CAPACITORS

Giacomo Giacomello, Milan, Italy, assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 23, 1981, Ser. No. 314,281
Int. Cl.³ H01G 9/24
U.S. Cl. 29—570 **5 Claims**



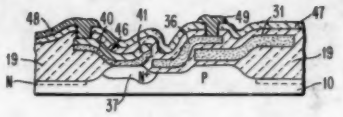
1. A two-stage process for accelerated aging and impregnating electrolytic capacitors comprising a first stage sequence of first loading capacitors having formed anodes into a centrifuge, second supplying a voltage less than the desired final aging voltage to said capacitors, third reducing pressure within said centrifuge, fourth starting said centrifuge, fifth admitting impregnating electrolyte, and aging said capacitors while centrifuging and impregnating until said capacitors are fully impregnated, and a second stage of increasing said voltage to said desired aging voltage.

4,403,394

FORMATION OF BIT LINES FOR RAM DEVICE

Joseph F. Shepard, Hopewell Junction, and Paul J. Tsang, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1980, Ser. No. 217,371
Int. Cl.³ H01L 21/22, 21/28
U.S. Cl. 29—571 **13 Claims**



1. A method for forming a conductor line for connection through self-aligned contacts to a first portion of each of a plurality of devices on a monocrystalline silicon substrate with the first portion having an opposite conductivity to the conductivity of the substrate including:

providing separated portions of at least a layer of silicon nitride over each of a plurality of separated areas of the substrate with each area to have one of the plurality of the devices formed therein and the first portion of the device to be connected to the conductor line;

forming electrically insulating material on the substrate to electrically isolate each area having one of the separated portions of the layer of silicon nitride to form electrically isolated areas with each area to have one of the plurality of devices therein;

removing the separated portion of the layer of silicon nitride within each of the electrically isolated areas except in a portion in which a self-aligned contact and at least part of the first portion of one of the plurality of the devices are to be formed;

forming additional portions of each of the plurality of devices on the substrate within each of the electrically isolated areas in portions of the area in which the separated portion of the layer of silicon nitride has been removed after removal of the separated portion of the layer of silicon nitride except in the portion of the area in which the self-aligned contact and at least part of the first portion of each of the plurality of the devices are to be formed;

forming the first portion of each of the plurality of devices for connection to the conductor line after the additional portions of the device have been formed;

forming at least part of the first portion of each of the plurality of devices for connection to the conductor line in an area beneath a portion of the remaining portion of the layer of silicon nitride within each of the electrically isolated areas;

removing the remaining portion of the layer of silicon nitride to form the self-aligned contact with at least the part of the first portion of the device in each of the electrically isolated areas after formation of at least the part of the first portion of the device not beneath the remaining portion of the layer of silicon nitride within each of the electrically isolated areas;

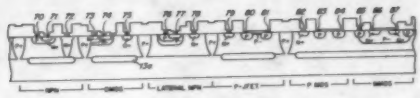
and forming the conductor line on the electrically insulating material on the substrate in electrical contact through the self-aligned contact with at least part of the first portion of each of the plurality of devices and of a material selected from the group consisting of polycrystalline silicon and a metal silicide, polycrystalline silicon and a conductive metal, and polycrystalline silicon, a metal silicide, and a conductive metal with the polycrystalline silicon contacting at least part of the first portion of the device.

4,403,395

MONOLITHIC INTEGRATION OF LOGIC, CONTROL AND HIGH VOLTAGE INTERFACE CIRCUITRY

Patrick A. Curran, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 12,267, Feb. 15, 1979, Pat. No. 4,325,180. This application Nov. 9, 1981, Ser. No. 319,866
Int. Cl.³ H01L 21/265
U.S. Cl. 29—571 5 Claims



1. A process for the monolithic integration of a semiconductor circuit having D-MOS and high performance vertical NPN components, comprising the steps of:

(a) providing a monocrystalline p-type semiconductor substrate having a surface layer of isolated n-type semiconductor regions thereon;

(b) forming a lightly-doped p-type D-well region in each of selected said n-type regions;

(c) forming p-type regions constituting the vertical NPN base and the D-MOS gate contact;

(d) then selectively forming n-type regions constituting the vertical NPN emitter and collector; and

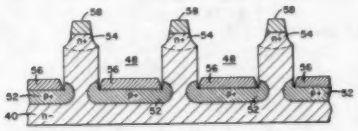
(e) controlling the dopant concentration in step (b) such that said D-MOS threshold is determined by the intersection of said emitter and said D-well dopant profiles.

4,403,396

SEMICONDUCTOR DEVICE DESIGN AND PROCESS

Richard J. Stein, Stow, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 24, 1981, Ser. No. 334,393
Int. Cl.³ H01L 21/265, 21/302
U.S. Cl. 29—571 6 Claims



1. A method for forming a structure for a vertically structured semiconductor device comprising:

depositing impurities on a surface of a semiconductor material of a first conductivity type to uniformly increase the impurity concentration of a contact layer adjacent said surface sufficient to provide contact areas on said surface;

forming a protective layer over said surface;

opening windows through said protective layer;

isotropically etching grooves into said semiconductor material to form partial grooves underlying said windows to a depth through said contact layer and greater than the width of said grooves;

anisotropically etching to deepen said grooves beneath said windows, the bottom of each of said grooves being at least as wide as the top thereof;

depositing impurities into said semiconductor material at the bottom of said grooves to form a semiconductor region of a second conductivity type opposite said first conductivity type at the bottom of each of said grooves, the semiconductor regions at the bottom of adjacent grooves forming a channel therebetween from said contact layer to a bulk region of said semiconductor material;

removing said protective layer; and

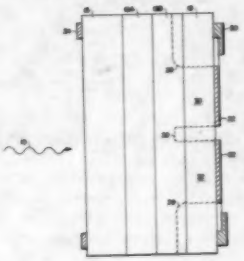
depositing metal over said surface whereby said metal deposits on said contact area and on the bottom of each of said grooves, the walls of said grooves providing isolation between the metal on said contact areas and the metal on the bottoms of said grooves.

4,403,397

METHOD OF MAKING AVALANCHE PHOTODIODES

Nicholas Bottka, and Marian E. Hills, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 13, 1981, Ser. No. 282,783
Int. Cl.³ H01L 21/76, 27/14, 21/363
U.S. Cl. 29—572 7 Claims



1. A method of making avalanche photodiode segmented detectors with at least one active layer from an epitaxially grown heterostructure sample of $GaAs_{1-x}Sb_x$ epitaxially grown on an Sn doped GaAs substrate comprising the steps of:

(a) applying a photoresist solution to coat both sides of the sample;

(b) exposing at a preselected wavelength, the sample's active layer through a first mask to open a plurality of windows on said sample;

(c) etching the sample;

(d) plating a conductive material over said plurality of windows on said active layer;

(e) applying a layer of photoresist on the epilayer side of the sample;

(f) exposing said epilayer side applied layer through a second mask at a preselected wavelength, said second mask having different dimensions than said first mask;

(g) bombarding said epilayer side of said sample with protons to produce semi-insulating volumes on said epilayer side where photoresist does not cover said epilayer side surface;

(h) removing said unexposed layer of photoresist such that no photoresist remains on the sample;

(i) applying a layer of photoresist to coat both sides of the sample;

(j) exposing the epilayer side of photoresist through a third mask at a preselected wavelength;

(k) etching said sample;

(l) depositing electrode contacts on the conductive material on said epilayer side of said sample;

(m) plasma-etching away said undeveloped photoresist with O_2;

(n) depositing ohmic contacts on preselected portions of the substrate side of said sample;

(o) cleaving the edges of said sample to reduce leakage current;

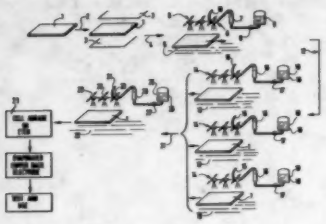
(p) mounting said sample; and

(q) making electrical contacts to said deposited ohmic contacts and said deposited electrode contacts.

4,403,398
METHOD OF MANUFACTURING A CADMIUM SULPHIDE PHOTO-VOLTAIC DEVICE

Alexander S. Laurie, Melbourn, and Robert C. Whelan, Comberton, both of England, assignors to Prutec Limited, England

Filed Dec. 9, 1981, Ser. No. 328,926
Claims priority, application United Kingdom, Dec. 12, 1980, 8039836
Int. Cl.³ H01L *21/363, 31/06*
U.S. Cl. 29—572 **10 Claims**



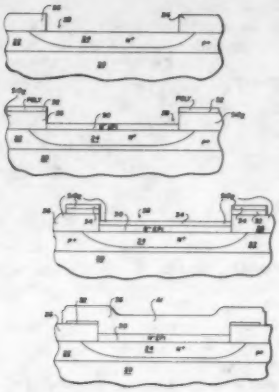
1. In a method of manufacturing a cadmium sulphide photo-voltaic device which comprises;
- forming a conductive layer to act as a first electrode, depositing on the conductive layer a layer of cadmium sulphide,
- forming a layer of copper sulphide in contact with the cadmium sulphide layer to produce a photo-voltaic junction, and
- forming a second electrode in contact with the copper sulphide;
- the improvement wherein the step of depositing the cadmium sulphide layer comprises;
- spraying onto the heated conductive layer a first precursor solution having such a cadmium concentration as to result in cadmium sulphide being deposited at a relatively slow first rate, and
- subsequently spraying with a second solution having a significantly greater cadmium concentration such that cadmium sulphide is deposited at a rate at least five times greater than the first rate.

4,403,399
METHOD OF FABRICATING A VERTICAL FUSE UTILIZING EPITAXIAL DEPOSITION AND SPECIAL MASKING

David L. Taylor, Carrollton, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 28, 1981, Ser. No. 306,226
Int. Cl.³ H01L *21/20, 21/283, 27/10*
U.S. Cl. 29—574 **5 Claims**

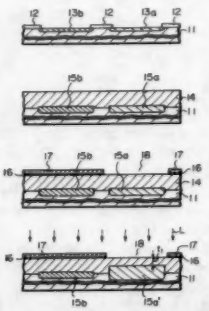
1. In a process of fabricating a programmable read only memory including forming a plurality of emitter followers, one for each cell, wherein the emitter being formed by introducing impurities into a base region through an aperture in an insulative layer, the improvement comprising:
- removing any material in the emitter diffusion aperture;
- epitaxially growing a thin layer of semiconductor material of conductivity type opposite that of said emitter on said insulative layer and in said aperture;
- partially oxidizing said epitaxial layer;
- removing said epitaxial layer on said insulative layer except on portions adjacent said aperture;
- removing oxide from all remaining portions of said epitaxial layer; and
- forming a metallic contact to said remaining portions of said epitaxial layer wherein said epitaxial grown layer is of a thickness such that atoms of said metallic contact will migrate thereacross upon application of migration inducing voltage to said contact.



4,403,400
PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE

Junji Sakurai, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 10, 1982, Ser. No. 347,586
Claims priority, application Japan, Feb. 17, 1981, 56-22005
Int. Cl.³ H01L *21/74*
U.S. Cl. 29—576 B **15 Claims**



1. A process for producing a semiconductor device on a semiconductor substrate, comprising the steps of:
- (a) forming buried regions within the semiconductor substrate by introducing an impurity;
- (b) forming an epitaxial layer, having a surface, on the semiconductor substrate and the buried regions; and
- (c) selectively irradiating the surface of the epitaxial layer with an energy beam to cause diffusion of the impurity from at least one of the buried regions into the epitaxial layer.

4,403,401

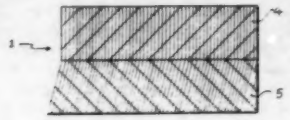
METHOD OF MAKING A DYNAMOELECTRIC MACHINE STATOR HAVING CONCENTRIC AMORPHOUS METAL LAMINATIONS

George M. Rosenberry, Hendersonville, Tenn., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 942,852, Sep. 15, 1978. This application Aug. 26, 1981, Ser. No. 296,387

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—596 **5 Claims**



1. A method of making a dynamoelectric machine stator comprising the steps of:

a. forming first and second helical ribbons of high magnetic induction amorphous metal alloy,

b. arranging a selected length of said first ribbon to form a first edgewound helix having its adjacent turns stacked on one another to form a first cylinder,

c. arranging a selected length of said second ribbon to form a second edgewound helix having each of its turns disposed in frusto-conical relation to the central longitudinal axis of said second helix and stacked on one another to form a second cylinder, and then

d. mounting the second cylinder within the first cylinder with the inner edges of the turns of the first cylinder, respectively, abutting the outer edges of the turns of the second cylinder.

4,403,402

METHOD FOR PRODUCING A MAGNETO DEVICE FOR GENERATING SIGNALS

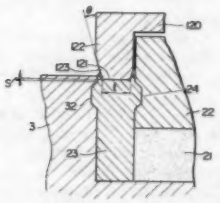
Tosio Tomite, Katsuta; Nobuhiko Ogasawara, Mito; Kaniti Isii, and Hisanobu Kanamaru, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 45,971

Claims priority, application Japan, Jun. 16, 1978, 53/72138

Int. Cl.³ H02K *15/02*

U.S. Cl. 29—598 **7 Claims**



1. In a method for producing a magneto device for generating signals, the magneto device comprising a pole piece assembly including a permanent magnet and a pole piece block adapted to be secured to a rotary body, and a stationary signal output coil cooperative with said pole piece assembly, said method comprising the steps of:

forming a recess in said rotary body at a position where said pole piece assembly is firmly held in said rotary body, said recess being dimensioned so as to accommodate said permanent magnet and pole piece block while leaving an annular space;

inserting a cylindrical key member, said permanent magnet and said pole piece block into said recess, said key member surrounding said permanent magnet and said pole piece block and being made of a non-magnetic material of a given mechanical strength which is less resistive to deformation than said rotary member and pole piece block, and having a height approximating that of said annular space;

pressing a metal mold against said key member to plastically deform the key member to thereby secure said pole piece assembly to said rotary body by a rigid engagement of the deformed key member with said rotary body and said pole piece assembly.

4,403,403

METHOD OF MAKING A FLY BACK TRANSFORMER

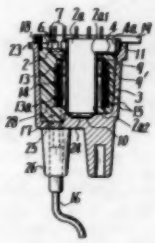
Mitsuru Hosoya, Fujisawa; Toshio Onodera, Kamakura, and Ken Tanimura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 86,617, Oct. 19, 1979, abandoned. This application Jul. 16, 1981, Ser. No. 284,102

Claims priority, application Japan, Oct. 20, 1978, 53-144832

Int. Cl.³ H01F *41/00*

U.S. Cl. 29—602 R **1 Claim**



1. The method of making a fly-back transformer comprising the steps of:

mounting a first hollow cylindrical bobbin with a low voltage winding thereon within a second hollow cylindrical bobbin with at least one high voltage winding mounted thereon, connecting a plurality of input and output terminals to said low and high voltage windings,

mounting a core receiving member having an integral cover plate over at least one end of said first bobbin,

mounting said first and second bobbins, said core receiving member and said terminals in a mold, said mold,

injecting thermal setting resin into said mold,

removing said first and second bobbins, said core receiving member and said input and output terminals from said mold after said resin has set,

removing said integral cover plate from said core receiving member, and

attaching a generally C-shaped core to said first bobbin such that its open ends engage the ends of said first bobbin and said core receiving member.

4,403,404

METHOD OF MAKING A CELLULOSE-FREE TRANSFORMER COILS

Dean C. Westervelt, Bullskin Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 308,314

Int. Cl.³ H01F *41/06*

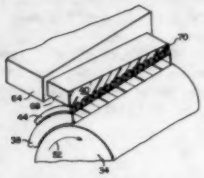
U.S. Cl. 29—605 **5 Claims**

1. A method for making a non-cellulose insulated transformer coil comprising the steps of:

(a) providing a winding mandrel for repeated rotation past a resin applicator and a resin curing station;

(b) applying a layer of resinous material onto the mandrel upon a single rotation of the mandrel, forming a tubular hub;

(c) curing the layer of resinous material in place as the mandrel is rotated adjacent to the curing station;
(d) coiling a first number of turns of a conductor helically onto and over the tubular hub;
(e) applying a first tapered resinous insulator coextensive with and around the first turns of conductors and having a thin edge at one end of the first layer and a thick edge at the other end thereof;
(f) curing the first tapered resinous insulator;
(g) coiling a second number of turns of the conductor helically onto and over the first tapered resinous insulator on the side opposite the first number of turns;



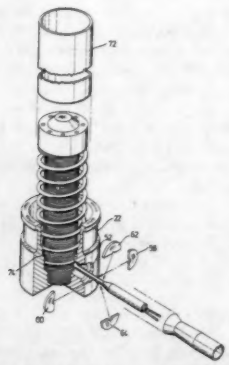
(h) applying a second tapered resinous insulator coextensive with and around the second turns of conductor, and having thin and thick edges oppositely disposed to those of the first tapered insulator;
(i) curing the second tapered resinous insulator;
(j) coiling a third number of turns of the conductor helically onto and over the second tapered resinous insulator on the side opposite the second number of turns; and
(k) the layers of resinous material being each applied at steps (b), (e), and (h) during one revolution of the mandrel.

4,403,405

SPRUE BUSHING CONNECTOR ASSEMBLY METHOD

Jobst U. Gellert, 7A Prince St., Glen Williams, Canada

Filed Jul. 20, 1981, Ser. No. 285,260
Claims priority, application Canada, Jul. 15, 1981, 381799
Int. Cl.³ H05B *3/04*
U.S. Cl. 29—611 **4 Claims**



1. In a method of manufacturing an integral electrically heated sprue bushing having a hollow elongated inner core portion with a runner passage extending centrally therethrough, an electrical heating element with a helical portion encircling the inner core portion and a lead portion extending out through an aperture in the sprue bushing, a highly conductive elongated portion around the helical portion of the heating element, and an elongated outer sleeve portion over the conductive portion, including the steps of assembling the heating element onto the core portion, securing the outer sleeve in a position around the inner core portion to enclose a space therebetween, the space being sufficiently sealed to prevent substantial leakage, and vacuum filling the space with a highly conductive material;

the improvement wherein the aperture is considerably larger than the heating element lead portion extending therethrough leaving a space therearound and the aperture has seat means, further including the steps of:

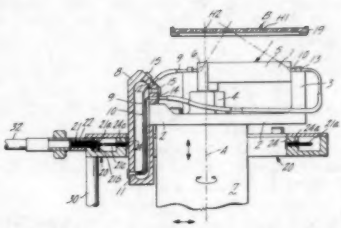
(a) forming a first split washer with a central opening through which the heating element lead portion extends by fitting a first plurality of split washer portions in the seat means in the aperture around the heating element lead portion to substantially close said space therearound,
(b) forming a second split washer similar to the first split washer adjacent thereto by fitting a second plurality of split washer portions in the seat means in the aperture around the heating element lead portion, and
(c) rigidly fixing a hollow elongated connector sleeve to the bushing with one end received in the aperture adjacent the second split washer and the heating element lead portion extending therein for connection to external lead wires.

4,403,406

COMPONENT POSITION INDICATOR FOR ELECTRONIC COMPONENT INSERTION STATION

Michael S. Foley, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Mar. 15, 1979, Ser. No. 20,709
Int. Cl.³ B23P *21/00*
U.S. Cl. 29—721 **11 Claims**



1. Apparatus for securing a component having more than one lead-in wire to a circuit board containing a plurality of apertures disposed therein, said apparatus including:

support means for said circuit board;
securing means for affixing the component to said circuit board disposed on one side of said support means;
means for moving said securing means relative to said support means;
first illuminating means carried with said securing means and disposed on the same side of the support means as said securing means and arranged to illuminate an aperture of said circuit board that is substantially aligned with an aperture to indicate the intended location for one of said lead-in wires.

4,403,407

MULTIPLE WIRE TERMINAL APPLYING

Ralph Mazzola, Brighton, Mass., assignor to Ark-les Corporation, Watertown, Mass.

Filed Jun. 1, 1981, Ser. No. 270,616
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 **8 Claims**

1. An automatic multiple wire terminal applying machine for simultaneously attaching at least one terminal, of a terminal strip of terminals attached sidewise to one another to form said terminal strip and fed in its longitudinal direction in a terminal strip plane along a terminal strip feed path, to the adjacent ends

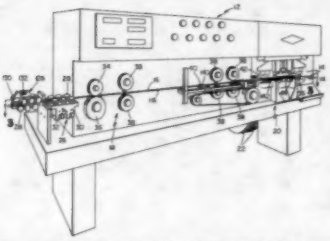
of parallellized multiple lengths of wire arranged in a plane parallel to and spaced from said terminal strip plane and fed in their longitudinal direction along a wire feed path perpendicular to said terminal strip feed path

said machine including

terminal applicator means having a terminal applicator station with a terminal applicator position at the end of said terminal strip feed path

terminal strip carrier feed means for feeding said terminal carrier strip in its longitudinal direction in a terminal strip plane along said terminal strip feed path to said terminal applicator station to place at least one terminal in terminal attaching position

multiple wire feed means for simultaneously feeding said



multiple lengths of wire in their longitudinal direction in a wire feed plane parallel to and spaced from said terminal strip plane along said wire feed path to a position adjacent said terminal applicator station, and

multiple wire guide means for guiding the ends of said multiple wires toward said terminal applicator station to place said wire ends in terminal attaching position,

said multiple wire feeding means comprising multiple parallel wire feed tube means for feeding simultaneously said multiple parallel lengths of wire, and

said feed tube means comprising a plurality of parallel outer tubes connected together to provide a recessed cavity at their forward ends for receiving attached terminals therewithin when feeding said attached terminals through said machine.

4,403,408

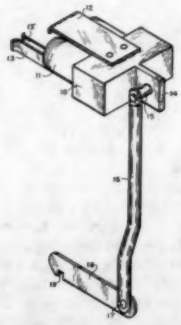
PRINTED CIRCUIT CARD EXTRACTING TOOL

James V. Koppensteiner, Chicago, and Joseph B. Onesto, Oak Lawn, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 18, 1981, Ser. No. 274,902

Int. Cl.³ H05K *3/36*

U.S. Cl. 29—764 **4 Claims**



1. A tool for facilitating the extraction of a printed circuit card from a holder, the latter having top and bottom parallel card guides each card guide including at least one transversely oriented guide track having respective lateral card edges resting therein, said circuit card including a handle mounted to a transverse edge of said circuit card, said tool comprising:

a mounting body including at least one magnet and a retainer clip, said magnet and retainer clip extending outward from a front face of said mounting body arranged to engage and attach said mounting body to said top card guide;

a pair of L-shaped spring guides arranged parallel to each other extending outward from said mounting body parallel to said magnet, said spring guides arranged to receive said circuit card therebetween when said mounting body is installed on said card guide;

a handle rotatably mounted to said mounting body; and

a linkage rotatably mounted to said handle opposite said mounting body said linkage including means for interlockingly engaging said circuit card handle;

whereby a pulling force applied to said handle extracts said circuit card from said holder.

4,403,409

FASTENING APPARATUS AND CONTROL SYSTEMS THEREFOR

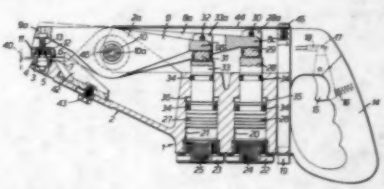
Edwin H. Richards, Ripple, England, assignor to L & H Designs Limited, Gloucestershire, England

Filed Feb. 17, 1981, Ser. No. 235,260

Claims priority, application United Kingdom, May 6, 1980, 8015047

Int. Cl.³ B23P *19/00, 11/00*

U.S. Cl. 29—798 **11 Claims**



1. In an apparatus operable to fasten together overlying metal sheets or webs, wherein a co-operating piercing-and-forming punch and die set is operable partially to sever and to displace a localised region of said sheets out of the planes thereof, and a flattening punch is then operable to spread the displaced region and thus fasten the sheets together with a clenching action, the improvement comprising:

a die mounting section on which said piercing-and-forming die is mounted;

a punch mounting section on which said flattening punch is mounted;

first and second hydraulically-operated piston and cylinder arrangements by which said die and punch mounting sections are respectively and separately operable, in sequence, for required movements relatively to said piercing-and-forming punch;

first and second lever arms which share a common intermediate pivot axis and at adjacent ends of which said piercing-and-forming die and said flattening punch are respectively mounted, said piston and cylinder arrangements including hydraulic pistons acting at the other ends of said first and second arms; and

a third lever arm with which each of said first and second lever arms has a scissor relationship, which is fixed with respect to hydraulic cylinders of said piston and cylinder arrangements, and which mounts said piercing-and-forming punch.

4,403,410

MANUFACTURE OF PRINTED CIRCUIT BOARDS

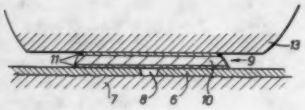
John E. Robinson, Dukinfield, England, assignor to International Computers Limited, London, England

Filed Jan. 14, 1981, Ser. No. 225,092

Claims priority, application United Kingdom, Jan. 23, 1980, 8002345

Int. Cl.³ A05K 3/36

U.S. Cl. 29—830 5 Claims



1. A process for the manufacture of a printed circuit board assembly including the steps of manufacturing a printed circuit board by forming a conductive layer comprising at least one conductive track on a sheet of insulating material; testing each such conductive track for electrical continuity to detect any defect in the continuity of the track; repairing the detected defect by providing a strip of electrically conductive material of a length sufficient to bridge the defect and overlap the track on both sides of the defect, positioning the strip to bridge the defect with its ends overlapping the track with a layer of solder interposed between the strip and the track; applying heat to cause the solder layer to reflow so that on cooling the strip is bonded to the track and is effective to repair the defect in electrical continuity of the track; and thereafter performing further steps in the manufacture of the assembly during which the repaired printed circuit board is subjected to heating to a temperature at which the solder melts.

4,403,411

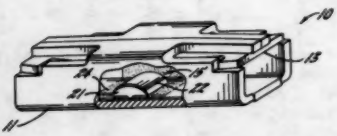
METHOD OF FORMING PRECIOUS METAL ELECTRICAL CONTACT

George A. Patton, Candler, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 4, 1981, Ser. No. 231,329

Int. Cl.³ H01R 43/02

U.S. Cl. 29—879 1 Claim



1. The method of forming a precious metal electrical contact portion on that portion of a blank to be formed into an inner wall of an elongated copper pin-socket box comprising the steps of forming a tab by cutting a short link from the end of a carrier ribbon made of essentially nickel base metal having one surface plated with essentially gold precious metal, resistance welding the base metal to said portion of a blank to be formed into the interior copper wall through at least one ridge formed on the non-plated side of said tab, and coating the tab and surrounding portion of the blank to be formed into a wall area with a precious metal, essentially gold, wash so that no base metal is exposed.

4,403,412

RAZOR BLADE ASSEMBLY

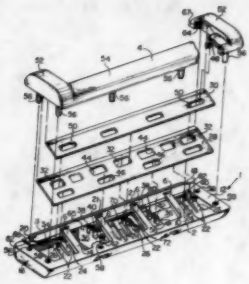
Robert A. Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 176,138, Aug. 7, 1980, Pat. No. 4,324,041, and a continuation-in-part of Ser. No. 229,623, Jan. 29, 1981, Pat. No. 4,337,575. This application Apr. 10, 1981, Ser. No. 253,071

The portion of the term of this patent subsequent to Apr. 13, 1989, has been disclaimed.

Int. Cl.³ B26B 21/22

U.S. Cl. 30—47 33 Claims



1. A razor blade assembly comprising a cap portion and a base portion, a guard portion extending from said base portion and extending generally parallel to said base portion, arm means extending from said base portion toward said guard portion, and blade means disposed on said arm means, said arm means being leaf spring means permitting movement of said blade means relative to said base portion, guard portion and cap portion during a shaving operation.

4,403,413

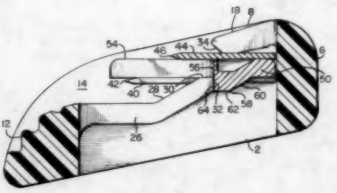
SHAVING IMPLEMENT

Robert A. Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 194,551, Oct. 6, 1980, Pat. No. 4,354,312. This application Sep. 11, 1981, Ser. No. 300,400

Int. Cl.³ B26B 21/06, 21/22

U.S. Cl. 30—47 3 Claims



1. A shaving implement comprising a platform portion, a back portion upstanding from a lengthwise margin of said platform portion, a cap portion extending from said back portion and overlying said platform portion, and blade means adapted to be permanently disposed between said cap and platform portions, said cap portion being adapted to exercise a clamping pressure on said blade means, said blade means comprising a first blade member, a spacer member, and a second blade member, said spacer member being disposed between said first and second blade members, said blade and spacer members being in abutting engagement and adapted to be held together by said clamping pressure, but otherwise being un-

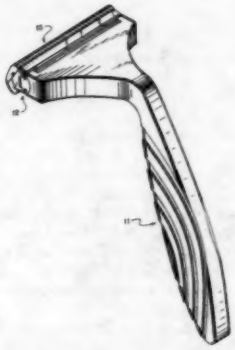
connected, said spacer having a lug extending from its underside proximate either end thereof, and said platform portion having a pair of integrally molded leaf spring members sufficiently flexible to permit said lugs to ride thereover during insertion of said blade means between said platform and cap portions, but biased to thereafter snap into locking engagement with said lugs to lock said spacer permanently in said disposition between said platform and cap portions.

4,403,414

SOCKET DEVICE FOR A PIVOTAL RAZOR

Ernest F. Kiraly, Fairfield, and Ernest A. Ortiz, Cheshire, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 9, 1981, Ser. No. 252,638
Int. Cl.³ B26B *19/00, 21/00*
U.S. Cl. 30—57 **13 Claims**



1. In a razor including a single or multiple blade cartridge of the type carried by a socket mounted movably in a support by means of interlocking arcuate flanges, said socket being pivotal through an arc on opposite sides of a neutral position about an axis parallel to a blade and slidable to and fro through a stroke along a path parallel to said axis, the improvement comprising:

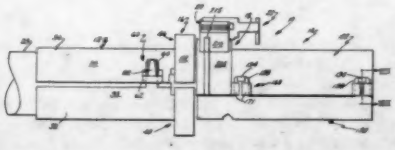
a plurality of pockets formed in said support, said pockets being disposed along a line generally corresponding to the pivot side of the socket, each pocket having a bearing surface, a thrust bearing element projecting from said socket and cooperating with the bearing surface and said arc and spring means carried by said socket operable to engage second and third pockets to bias said socket toward said neutral position.

4,403,415

WINDOW SHADE ROLLER WITH SHADE CUTTING ASSEMBLY

Fred W. Kufrin, Janesville, Wis., assignor to Fox Valley Corporation (Breneman Div.), Norcross, Ga.

Filed May 14, 1981, Ser. No. 263,554
Int. Cl.³ B26D *1/26*
U.S. Cl. 30—96 **34 Claims**



1. A shade cutter adapted to be mounted on a rolled shade or the like and positioned to cut the shade to a desired length, said cutter comprising:

an elongaed, tubular shade holder defining a passage for receiving the rolled shade;

an elongated, tubular collar also defining a passage for receiving the rolled shade, said holder and said collar dimensioned to be gripped by a user;

connecting means on said shade holder and said collar for rotatably connecting said collar to said shade holder and positioning same in generally coaxial relationship; and

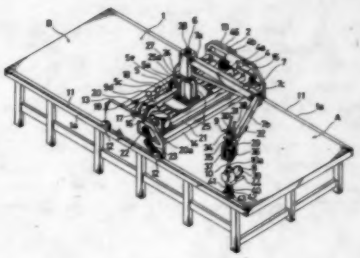
cutting means carried by said collar for cutting the shade upon rotation of said collar with respect to said holder, said cutting means including a cutting blade having an edge aligned generally perpendicular to the longitudinal axis of said collar and which is shiftable into the collar and towards the rotational axis of said collar.

4,403,416

CLOTH-CUTTING MACHINE

Shoichi Adachi, Osaka, Japan, assignor to N.C.A. Co., Ltd., Japan

Filed May 27, 1981, Ser. No. 267,467
Claims priority, application Japan, Feb. 6, 1981, 56-16363[U]; Feb. 6, 1981, 56-16364[U]; Feb. 6, 1981, 56-16365[U]
Int. Cl.³ D06H *7/00;* **B26D** *5/00*
U.S. Cl. 30—273 **1 Claim**



1. A cloth-cutting machine, comprising:

a working table;

a carriage arranged for horizontal reciprocation over the table, the carriage having side frame members interconnected by a plurality of cross frame members, at least one of which is hollow;

an upstanding post disposed on at least one of the cross frame members of the carriage;

a support arm extending transversely from the post and mounted for horizontal rotation around the post;

extensible cylinder means having a cylinder affixed to the free end of the support arm and a piston assembly vertically reciprocable relative to the cylinder;

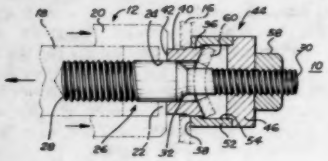
cutting means, having an automatic cutter, supported by the piston assembly of the cylinder means for vertical movement between a lower cutting position and an upper flying-over position, the cylinder means absorbing substantially all vibration due to operation of the cutting means, which would otherwise be transmitted back to the carriage and working table through the support arm and post; and,

an air compressor mounted on at least one of the cross frames of the carriage, the at least one hollow frame member forming an integral compressed air tank for driving the piston assembly of the cylinder means between the upper and lower positions, whereby the cutting means may be selectively operated on and fly over the entire working table.

4,403,417
DRAW PUNCH

Stephen K. Wilson, 18625 88th W., and Raymond I. Beatty, 23610 107th W., both of Edmonds, Wash. 98020

Filed Jun. 4, 1982, Ser. No. 385,063
Int. Cl.³ B26F 1/00
U.S. Cl. 30—360 12 Claims



1. A draw punch for enlarging a pilot hole in a wall, comprising:

(a) an actuating rod having a major diameter section, a minor diameter section and a beveled pilot shoulder interconnecting the rod major and minor diameter sections;

(b) a male punch slidably engageable over the rod major diameter section;

(c) a female die including:

a backing member engageable over the actuating rod minor diameter section, the side of said backing member facing the punch defining piloting means; and

a cylindrical member having a smaller, inner diameter portion adjacent the punch to define a cutting face and to snugly, slidably receive the punch, and a larger inner diameter clearance portion engageable with the piloting means to coaxially align the die cylindrical member with the actuating rod; and

(d) securing means for preventing disengagement of the die backing member from the actuating rod when the punch and die, which are disposed on opposite sides of the wall, are forced relatively towards each other to sever the wall.

4,403,418
DEVICE TO DETERMINE AND RECORD SMALL DIMENSIONS

Ernest Vagias, 265 Prospect St., Baden, Pa. 15005

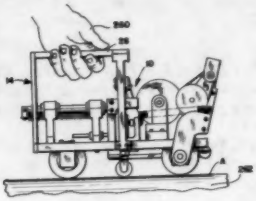
Filed Dec. 14, 1981, Ser. No. 330,338
Int. Cl.³ G01B 3/18; B43K 29/00
U.S. Cl. 33—164 R 5 Claims

1. A device for use in determining and recording a precise dimension, said device comprising, in combination, first and second generally cylindrical hollow members having between them a threaded connection, an end of said first member being received within said second member, writing means supported within said first and second members and projecting outwardly from an end of one of said members which is remote from said threaded connection, collar means upon each of said members, said collar means being adapted to be brought into contact with an object to be measured, and indicia upon each of said members, said indicia being adapted to indicate the dimension to be determined of said object.

4,403,419
SURFACE PROFILE RECORDER

J. Robert Graves, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 22, 1981, Ser. No. 275,565
Int. Cl.³ G01B 5/20
U.S. Cl. 33—174 P 21 Claims



1. A surface profile recorder comprising:

a frame;

front and rear roller means mounted to and extending below said frame;

follower means rotatably mounted to said frame and having a portion capable of rotation from said frame to a position below said front and rear roller means;

lever means including a follower engaging member and a substantially upright, elongate stylus support member;

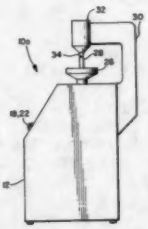
support means mounted to said frame pivotally mounting said lever means and including means urging said follower engaging member against said follower means such that rotation of said follower means causes said lever means to pivot in response thereto; and

means including a stylus mounted to said support means for recording pivotal movement of said lever means and thereby recording rotational movement of said follower means.

4,403,420
DIGITAL GAUGE FOR MEASURING SAGITTAL DEPTH AND THICKNESS OF LENS, AND RELATED SYSTEM AND METHOD

Kimber W. Rarick, Muskogee, Okla., assignor to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed Jul. 27, 1981, Ser. No. 286,828
Int. Cl.³ G01B 7/06, 7/28
U.S. Cl. 33—174 A 20 Claims



15. A system for automatically computing the sagittal depth and thickness of a lens, comprising:

a base having a bell mounted thereon;

gauging means for gauging the sagittal depth and thickness, respectively, of the lens, said gauging means comprising a gauging probe located above said bell, and a moveable plunger located concentrically within said bell and in alignment with said gauging probe, said moveable plunger

being moveable in an upward or downward direction within said bell and substantially perpendicular to said base;

encoder means actuated by said gauging means for providing electrical signals corresponding to the sagittal depth and thickness, respectively, of the lens;

digital means responsive to the electrical signals corresponding to the sagittal depth and thickness, respectively, of the lens for producing first and second digital outputs representing the sagittal depth and thickness, respectively, of the lens; and

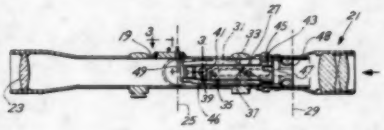
processor means for receiving and processing said first and second digital outputs to derive the thickness and sagittal depth, respectively, of the lens.

4,403,421

TELESCOPIC GUN SIGHT

Daniel R. Shepherd, R.R. #1, P.O. Box 23, Waterloo, Nebr. 68069

Filed Nov. 13, 1980, Ser. No. 206,668
Int. Cl.³ F41G *1/38, 1/42*
U.S. Cl. 33—246 **20 Claims**



1. A telescope sight for sighting-in and aiming a firearm, comprising:

objective lens means for presenting an object onto an image plane;

inverting tube means positioned relative to said image plane for inverting the object image appearing in said image plane;

occular lens means for presenting the inverted object image for viewing;

a primary reticule for constantly defining the center point of the field of view of the sight for defining a first aiming sight position through the telescope sight, said primary reticule positioned at and in a fixed relationship with one end of said inverting tube means, said one end being the end disposed more distally from said image plane;

first adjustment means manually actuable for positioning the other end of said inverting tube means relative to said one end, for adjusting said first aiming sight position of said primary reticule relative to the bore of the firearm;

a secondary reticule located at said image plane for establishing a reference point which defines the relationship of the primary reticule to the bore of the firearm, with respect to which said first adjustment means may be actuated for aligning the reticules to sight-in the firearm, said secondary reticule being movable both horizontally and vertically in said image plane independent of said inverting tube means; and

second adjustment means for moving said secondary reticule relative to said primary reticule for establishing said relationship.

4,403,422

STAR FINDER

Norman Sperling, 17 Thorpe St., Somerville, Mass. 02143, and George Loui, 4 Brattle Dr. #24, Arlington, Mass. 02174

Filed Jun. 19, 1981, Ser. No. 275,436
Int. Cl.³ G01C *17/34*
U.S. Cl. 33—268 **10 Claims**

1. A device for portraying the night sky in any specific latitude for any specific day and time, comprising inner and outer transparent nested hemispheres rotatable relative to each other about an axis perpendicular to their diametral side, indicia depicted on the concave surface of the outer hemisphere representing the heavenly bodies in relation to each other, and a non-transparent horizon shield on the inner hemisphere positioned so that when the hemispheres are rotated relative to

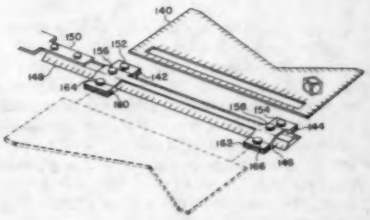
each other to match the day and time of observation, the perimeter of the horizon shield will define the area of the sky visible for that day and time and at the said specific latitude for which the device is to be designed to be used blocking out that portion of the sky which is not visible.

4,403,423

DRAFTING INSTRUMENT

Alan T. Ford, P.O. Box 531, Green Harbor, Mass. 02041, and Norman G. Graf, 225 High St., Hingham, Mass. 02043

Continuation-in-part of Ser. No. 73,220, Sep. 7, 1979, abandoned. This application Aug. 21, 1981, Ser. No. 295,094
Int. Cl.³ B43L *13/14*
U.S. Cl. 33—432 **2 Claims**



1. A drafting instrument for use in making axonometric projections, comprising

(a) a generally flat template of a relatively stiff material;

(b) said template being formed with a pair of straight parallel side edges, a straight bottom edge perpendicular to the side edges and a pair of mutually intersecting first and second straight upper edges;

(c) said upper edges extending generally from the side edges of said template downwardly and inwardly to define therebetween an angle corresponding to the angle of a selected axonometric projection;

(d) scale markings corresponding to the selected axonometric projection extending along the margins of said first and second upper and at least one of said side edges, said scale markings along the margins of said upper edges including a plurality of scale lines with the lines along the margin of said first upper edge oriented parallel to the second upper edge and the lines along the margin of said second upper edge oriented parallel to the first upper edge;

(e) said drafting instrument in combination with a slide adapted to be mounted slidably to a straight scale and the like and connecting means operatively associated with

said slide and said drafting instrument for connecting one to the other; and

(f) wherein said slide includes groove means along at least one side thereof to receive the lower edge of said template inserted therein.

4,403,424

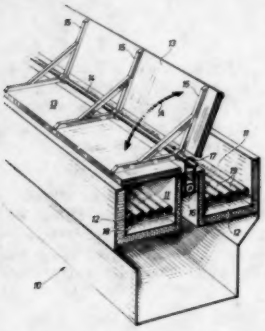
A DRIER CABINET FOR DRYING FIRE HOSES OR OTHER SIMILAR HOSES

Hans V. Wahlström, Bergasstigen 3, 182 33 Danderyd; Rolf E. Nilsson, Uttervägen 9, 195 00 Märsta, and Kjell A. Pihlgren, Uppland Väsby, all of Sweden, assignors to Hans V. Wahlström, Danderyd and Rolf E. Nilsson, Märsta, both of, Sweden

Filed Mar. 30, 1981, Ser. No. 248,706

Int. Cl.³ F26B *9/06*

U.S. Cl. 34—104 **8 Claims**



1. A drier cabinet for use in a drier for drying fire-hoses or other similar hoses, said drier cabinet comprising:

an elongated horizontal receptacle divided into two parallel drying chambers extending in side by side relationship along the length of the receptacle and having individually closable longitudinal openings at their upper ends, each of said chambers receiving a plurality of wet hoses through said longitudinal opening, the hoses being placed side by side in extended positions to undergo drying in said drying chambers upon closure of the longitudinal openings of the chambers; and

means for closing the longitudinal openings of said drying chambers to thereby enclose the hoses within the drying chambers, said means for closing comprising two covers, one for each drying chamber, said two covers being connected to each other so as to permit only one drying chamber at a time to be closed by its cover.

4,403,425

APPARATUS FOR DRYING AND SMOOTHING ARTICLES OF CLOTHING

Klaus Müssiger, Bad Salzuflen, Fed. Rep. of Germany, assignor to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Continuation of Ser. No. 49,831, Jun. 18, 1979, abandoned. This application Jun. 29, 1981, Ser. No. 278,157

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827433

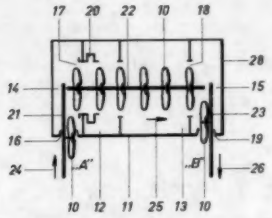
Int. Cl.³ B08B *3/02*

U.S. Cl. 34—162 **1 Claim**

1. An apparatus for the simultaneous drying and smoothing of washed articles of clothing (10), having a treatment chamber in the shape of a tunnel, the articles of clothing being conveyed therethrough, and a transport device for conveying the articles of clothing, which are suspended on hangers, transversely to the direction of conveyance of said articles of clothing through the tunnel, characterized by:

(a) a first non-treatment chamber (14) preceding the tunnel (11), a continuously open inlet opening (16) of the first non-treatment chamber extending perpendicularly relative to a continuously open outlet opening (17) thereof, the inlet opening (16) of the first non-treatment chamber (14) being relatively narrow to accommodate for longitudinal transportation of the articles of clothing therethrough, and the outlet opening (17) being relatively wide to accommodate for cross transportation of the articles of clothing (10) therethrough.

(b) a second non-treatment chamber (15) following the tunnel (11), a continuously open inlet opening (18) of the second non-treatment chamber extending perpendicularly



to a continuously open outlet opening (19) of the second non-treatment chamber, the inlet opening (18) of the second non-treatment chamber being relatively wide to accommodate for cross transportation of the articles of clothing therethrough and the outlet opening (19) thereof being relatively narrow to accommodate for longitudinal transportation of the articles of clothing (10) therethrough,

(c) first and second conveyance means (21, 23) for the transportation of the individual articles of clothing (10) through the first and second non-treatment chambers (14, 15), respectively and

(d) a hot air channel (20) in an area of the inlet opening of the tunnel (11) for, together with the first non-treatment chamber (14), preventing the escape of steam, hot air and the like from the tunnel.

4,403,426

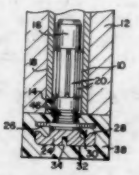
HEEL LIFT

S. Richard Kaplan, 5328 W. Grove St., Skokie, Ill. 60077

Filed Jul. 27, 1981, Ser. No. 287,306

Int. Cl.³ A43B *21/36, 21/39*

U.S. Cl. 36—36 R **15 Claims**



1. A replaceable heel lift construction comprising:

(a) an elongated body portion having a plurality of ridges extending axially along the body portion;

(b) a head portion having an upper surface which includes a continuous annular undercut coaxial with the body portion, said upper surface being connected to the lower end of said body portion, and a lower surface including a slot extending radially therethrough across the head portion

and in communication with said annular undercut to form at least one passage within said head portion;

(c) a ring member fitting around said body portion adjacent the upper surface of said head portion, said ring member comprising a continuous outer peripheral portion and having inwardly extending fingers engaging said body portion, the internal ends of said fingers defining a central opening in said ring member having a diameter slightly less than the outer diameter of said body portion whereby engagement of said fingers with said body portion serves to hold said ring member in place on said body portion in spaced apart relationship with respect to said head portion; and

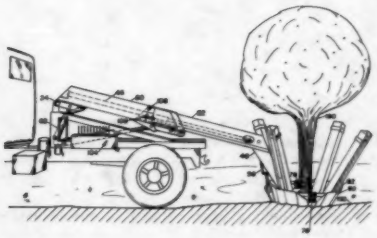
(d) a wearing portion formed of a molding material surrounding said head portion, said ring member and the spaces defined between said fingers and between said outer peripheral portion and said body portion, said molding material also extending between said head portion and said ring member and within the annular undercut, the slot and the passage within the head portion whereby said wearing portion is firmly secured in said construction.

4,403,427

TREE PLANTER

Arthur Dahlquist, 1404 E. Crystal Lake Rd., Burnsville, Minn. 55337

Filed Jun. 1, 1982, Ser. No. 384,021
Int. Cl.³ A01G *23/04*
U.S. Cl. 37—2 R **15 Claims**



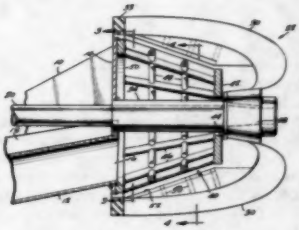
1. Tree planter comprising: vehicular chassis including a frame, an engine mounted on said frame, at least two axles of wheels axially mounted on said frame, a transmission connected between one of said axles and said engine, a hydraulic take-off power system for providing hydraulic pressure connected to said engine; a hoist frame means affixed to said vehicle frame and supporting a main pivot point, a boom including a telescopically extendable inner and outer boom assembly affixed at said main pivot point through a self-aligning bushing; a main boom hoist cylinder connected between a mid portion of said outer boom and a lower portion of said hoist frame means through self-aligning bushings, a side-swing cylinder connected between a side pivot point of said outer boom and said hoist frame means through self-aligning bushings, a yaw twist cylinder connected through a single bar linkage between said main pivot point and said hoist frame means through self-aligning bushings; said inner boom supporting a nose for a digger means, said inner boom slidable on a plurality of rollers supported at one end of said inner boom, and rollers at an outer end of said outer boom, and a track affixed to said inner boom and riding between opposing rollers affixed to an interior of said outer boom, and a hydraulic cylinder connected between the outer ends of said inner boom and said outer boom for telescopically extending and retracting said boom assembly, a nose pivot cylinder connected between said outer end of said inner boom and said digger means; said digger means pivoted on an end of said nose, said nose pivot cylinder mounted between self-aligning bushings; said digger means including a frame and including four hydraulically actuated spade towers, each of said spade towers supporting a spade actuated by said hydraulic cylinder, two gate pivots at opposing positions, said gate pivots supporting two of said hydraulically actuated spade towers, said gates actuated about said pivots by gate hydraulic cylinders mounted through self-aligning bushings for opening and closing said gate hydraulic spade towers about a mature tree whereby said main boom hoist elevator cylinder, said yaw twist cylinder, and said swing cylinder provide for all degrees of axial and radial freedom of movement of said boom assembly, said hydraulic cylinder connected between said ends of said outer and inner booms provides for telescopically extending and retracting action of said boom assembly carrying said digger means, and an octagonal digger means assembly providing for working in restricted areas and about trees, thereby providing for excavation, transportation and planting of a tree.

4,403,428

SUCTION DREDGE CUTTER HEAD

Marion R. Chapman, Jr., General Delivery, Gloucester, Va. 23061, and Marion J. Chapman, 1102D Holik, College Station, Tex. 77840

Filed Nov. 13, 1981, Ser. No. 321,238
Int. Cl.³ E02F *3/92*
U.S. Cl. 37—57 **8 Claims**



1. In a suction dredge having a ladder carrying a suction pipe and a driven cutter head of open-work divergently spiral toothed-rib construction which encloses and is rotatable about the mouth of the pipe, the combination of:

a crusher of open-work construction fixed relative to and enclosing the mouth within and cooperating with the cutter head on rotation thereof to crush therebetween large lumps passing through the cutter head to minimize damage and clogging of suction and discharge lines and the dredge pump, said crusher being of generally frusto-conical configuration and generally-coaxial with the head and being provided with interconnecting generally-circumferential and generally-longitudinal bars defining openings therebetween, whereby the head ribs sweep large lumps dug by the head into the clearance between the ribs and bars so as to exert a crushing action which breaks the lumps into smaller pieces which can pass through said openings and into the mouth of the pipe.

4,403,429

ARTICULATED ARM FOR EXCAVATOR MACHINES

Alois Haringer, Egna, Italy, assignor to VEMA, S.p.A., Egna, Italy

Filed Oct. 26, 1981, Ser. No. 314,968
Claims priority, application Italy, Nov. 4, 1980, 68686 A/80
Int. Cl.³ E02F *3/02*
U.S. Cl. 37—103 **4 Claims**

1. An articulated arm mounted on an excavator vehicle to permit the excavator which is movable along a working floor to make an excavation lateral thereto and parallel to the vehicle line of travel, comprising:

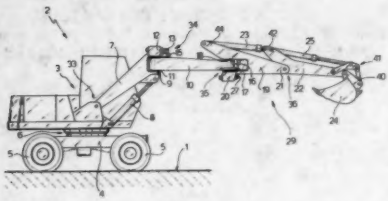
(a) a rigid arm hingedly connected at one end to the excava-

tor vehicle to permit the arm to move in a vertical plane perpendicular to the working floor,

(b) a second horizontally movable arm hingedly connected through a pin assembly to the other end of the first arm to permit the second arm to swing in a substantially horizontal direction to either side of the vehicle,

(c) the other end of the second arm hingedly supporting a third arm at one end thereof through a pin assembly for rotational movement in the same plane as the second arm, such that it can also move in a substantially horizontal direction,

(d) a fourth and shovel supporting arm hingedly connected to the other end of the third arm to permit it to move in a plane perpendicular to the plane containing the line of movement of the third arm,



(e) the hinged connections at each end of the second arm including an upright hinge pin,

(f) a motor directly mounted on each of the second and third arms in substantial alignment with and directly connected to the hinge connections for permitting movement of the interconnected arms in a large arc,

(g) locking-pin means associated with each of the hinge connections for permitting an arcuate locking arrangement of the second arm with respect to the first arm and the third arms,

(h) the locking means including a plurality of arcuately spaced fixing bores on one of the arms of each hinged connection at each end of the second arm, and a fixing pin integral with the other arm of each hinged connection which can be moved to engage any of the fixing bores.

4,403,430

PLOUGH WITH LATERAL EJECTORS FOR DISPLACING RAILWAY TRACK BALLAST

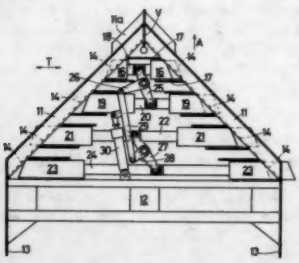
Sergio Valditerra, Alessandria, Italy, assignor to Matisa Materiel Industriel S.A., Switzerland

Filed Jan. 29, 1981, Ser. No. 227,681

Claims priority, application Italy, Oct. 22, 1979, 69052 A/79

Int. Cl.³ E02F 5/22

U.S. Cl. 37—104 **13 Claims**



1. A plow for laterally displacing compacted ballast of railway road beds, comprising:

a vehicle having means for propelling said vehicle along the road bed, a V-shaped plow mounted on said vehicle and having an apex and plow blades which extend at an angle rearwardly and laterally outwardly from the apex of said plow, each of said blades having spaced apertures in lower portions thereof,

a plurality of ejectors disposed in said apertures and movable transversely of the direction of movement of said vehicle between a retracted position and an extended position in which they project laterally outwardly from said blades, and power means for intermittently moving said ejectors laterally between said retracted position and said extended position as said plow is moved forwardly by said vehicle.

4,403,431

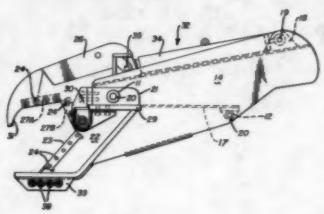
SELF-CONTAINED MATERIAL HANDLING AND SHEARING ATTACHMENT FOR A BACKHOE

Michael Ramun, and John Ramun, both of 2100 Poland Ave., Youngstown, Ohio 44502

Filed Jul. 19, 1982, Ser. No. 399,734

Int. Cl.³ E02F 3/76; B23P 19/00

U.S. Cl. 37—117.5 **6 Claims**



1. An improvement in a cutting and manipulating attachment for a backhoe, the bucket of which has been removed and having a boom and means for moving the boom; the improvement comprising a mounting body defining an elongated cavity arranged to receive a portion of said boom, means for attaching said mounting body to said boom, an elongated movable cutting blade having a pair of cutting edges arranged in a V-shape on a common plane parallel with said cutting blade, said cutting edges positioned in shearing relation to a fixed cutting blade on said mounting body, means pivotally mounting said elongated cutting blade on said mounting body in pivotal relation to said fixed cutting blade with at least one of said cutting edges arranged in approximately parallel spaced relation to said fixed cutting blade when said elongated movable cutting blade is in substantially open relation thereto, means on said mounting body for keeping said elongated movable cutting blade in shearing relation to said fixed cutting blade consisting of spaced parallel guides adjacent said fixed cutting blade defining an elongated guide path for a portion of said movable elongated cutting blade, a piston and cylinder positioned on said mounting body and pivotally connected to said movable cutting blade so that the same can be moved relative to said fixed body thereby.

4,403,432

TRAILER HITCH SNOW PLOW

Michael P. Biance, 7 Martingale Dr., Albany, N.Y. 12205

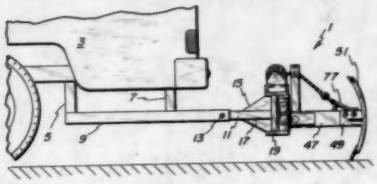
Filed Feb. 17, 1983, Ser. No. 467,400

Int. Cl.³ E01H 5/06; A01B 65/00

U.S. Cl. 37—235 **6 Claims**

1. A snow plow operatively carried on and upon the rear of a vehicle and with its plow blade disposed in positions of raised or lowered elevation, and traverse, relative to said vehicle; said snow plow comprising a tongue, pedestal assembly, pintle, sleeve, pin, first member, second member, winch means and plow blade; said vehicle having on its bottom rear segment a receiver, said receiver operatively carrying said tongue and

removably mounting said tongue, said tongue carrying said pedestal assembly, said pedestal assembly carrying said pintle, said pintle freely carrying said sleeve in rotary relationship and affording such traverse of said plow blade, said sleeve carrying said first member, said first member being in pivotal relationship with said second member and affording such elevation of said plow blade, said second member carrying said plow blade,



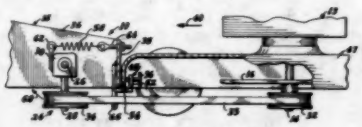
said winch means being operatively connected to said second member to raise or lower said plow blade to a discrete position of elevation, said pintle and sleeve having sets of aligned holes with each set of which corresponding to a discrete position of traverse of said plow blade, and said pin being removably engaged with a set of said aligned holes in said pintle and sleeve to lock said plow blade in a discrete position of traverse.

4,403,433

SNOW BLOWER AUXILIARY FOR ROTARY LAWN MOWER

Delmar A. Smith, Kokomo, Ind., assignor to Richard L. Rayl, Kokomo, Ind., a part interest

Filed Dec. 24, 1981, Ser. No. 334,434
Int. Cl.³ E01H *5/09*
U.S. Cl. 37—243 **2 Claims**



1. A snow blower auxiliary for a rotary lawn mower of a type having a vertical power shaft normally used for driving the cutter blade of the lawn mower, the snow blower auxiliary comprising:

snow blower means of a type having a support means, including a support member, and a rotatable means by which snow is gathered and forcibly ejected;

first power means, for receiving power drive from the vertical power shaft of the lawn mower, the shaft being the shaft normally used for driving the cutter blade of the mower;

second drive means, by which the power drive of the said first power means is utilized to drive the rotatable means of the snow blower means;

said second drive means including a horizontal power shaft, and a vertical drive shaft operatively interconnected thereto for power-transmission of power received through the said vertical drive shaft and powering the horizontal power shaft therefrom, and including a normally stationary body member means providing a support means with respect to which both the horizontal power shaft and the vertical drive shaft are relatively movable;

the first power means including driver means connected to the vertical drive shaft, and driven means drivably interconnecting the first power means and the said second drive means;

bearing means for supporting the said horizontal power shaft; and

the support means of the snow blower means supportingly interconnecting the bearing means to both the support member of the snow blower means and to the deck of the lawn mower, thereby achieving support of the horizontal power shaft of the snow blower means from the lawn mower merely by support from the deck thereof; and

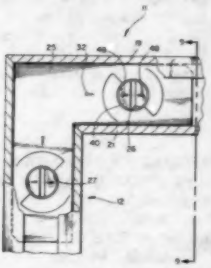
the normally stationary body member means being rotatable concentrically with respect to the axis of the horizontal power shaft, the rotation of the body member means about the axis of the horizontal power shaft causing rotation of the vertical drive shaft of the second drive means in a plane perpendicular to the horizontal power shaft.

4,403,434

PICTURE FRAME ASSEMBLY

Robert D. Jenkins, Indianapolis, Ind., assignor to David G. Reilich; Unipak, Inc. and Jeffrey J. Quinn, all of Indianapolis, Ind., part interest to each

Filed Jan. 18, 1982, Ser. No. 340,257
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152 **26 Claims**



1. A frame assembly comprising:

a plurality of framing members arranged in series, with the ends of each member meeting the ends of the next adjacent member in the series at junctions, to form a frame, each of said members having a generally C-shaped cross section comprising spaced facing wall means;

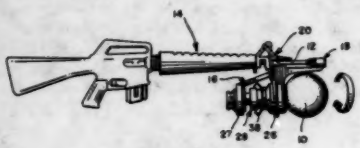
a plurality of connector assemblies, one of said connector assemblies being located at each of said junctions of frame members to connect the adjacent frame members together at the junction, each connector assembly including a bearing piece having at least two apertures therein spaced from each other and located on opposite sides of the junction between the two frame members being connected by the connector assembly at the junction, each of said bearing pieces of the connector assembly engaging one of said wall means of each of the two frame members on opposite sides of the junction and adjacent said apertures, and each connector assembly including at least two bearing pad means, each bearing pad means including a bearing pad portion engaging the other of said wall means of one of said frame members, and each bearing pad means including a locating stem received in one of said apertures of the connector bearing piece, the stem having a tool receiver therein;

said bearing pieces and bearing pad means having cooperating cam and follower means thereon operable by a tool when received in the tool receiver of the stem of the bearing pad means to tighten and loosen the connector assemblies between the said facing wall means at the junctions.

4,403,435
RELEASE AND ALIGNMENT MECHANISM FOR JET-PROPELLED PROJECTILES

Alan C. Baker, Huntington Beach; Nathan N. Shiovitz, Anaheim, and George E. Whiting, Santa Ana, all of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed Apr. 2, 1981, Ser. No. 250,427
Int. Cl.³ F41C 27/06
U.S. Cl. 42—1 F 22 Claims



1. A projectile release mechanism for facilitating launching a jet-propelled projectile, comprising:

a nozzle extending from said projectile, including fusible joint means for heating by high-temperature exhaust gases expelled by said projectile to release the projectile;

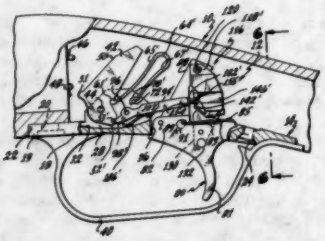
a projectile support means, including open-ended receptacle means generally coaxial with said nozzle for receiving the nozzle and thereby supporting said projectile; and

means for retaining the nozzle in said receptacle means and permitting fore and aft sections of said nozzle to move out of the open ends of said receptacle means on fusing and separation of said fusible joint means.

4,403,436
TRIGGER MECHANISM FOR MULTIPLE BARREL FIREARM PROVIDING BARREL SELECTION

Fred Jennie, Corona del Mar, Calif., assignor to Weatherby, Inc., South Gate, Calif.

Filed Sep. 8, 1981, Ser. No. 299,734
Int. Cl.³ F41C 19/00
U.S. Cl. 42—42 R 11 Claims



1. A firearm having double barrels and a trigger mechanism including a trigger, a hammer for each barrel, a sear for each hammer, connector means actuateable by the trigger and engageable with an individual sear for releasing its respective hammer, barrel selector means cooperative with the connector means for selecting an individual barrel to be fired by positioning of the connector means, said connector means being constructed to be moveable laterally by the selector means for a position for engagement with a first sear to a second position for engagement with a second sear, said connector means also being moveable in a forward direction from a position for engagement with a first sear to a position for engagement with a second sear, each sear and its respective hammer having a constructional relationship whereby after sear releases its hammer, the hammer rotates the sear, and means providing for engagement of each sear with the connector means whereby rotation of the sear causes movement of the connector means rearwardly to disengage it from the sear and means to move the connector means to a more forward position for engagement with the second sear.

4,403,437
TORSIONALLY LOADED TREBLE HOOK WITH PIVOTABLE WEED GUARD

Ervin H. Shuman, 720 NE. 18th Ave., Ocala, Fla. 32670

Filed Mar. 9, 1981, Ser. No. 241,726
Int. Cl.³ A01K 83/02
U.S. Cl. 43—36 6 Claims

1. A hook device for catching fish comprising:

a stationary hook having a shank portion and a curved portion;

at least one oscillatable hook having a shank portion and a curved portion disposed adjacent to the stationary hook;

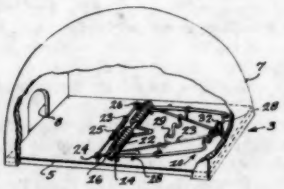
a slender torsion bar disposed parallel and adjacent to the shank portions of the stationary hook and the oscillatable hook, said slender bar being secured to the curved portion of the oscillatable hook in a preloaded condition;

a sleeve surrounding at least a portion of the slender torsion bar and the shank portions of the stationary hook and the oscillatable hook, said sleeve having an interior cross sectional area that provides a minimum clearance fit around the slender torsion bar and the shank portions of the stationary hook and the oscillatable hook whereby the cross sectional area of the hook device is minimized.

4,403,438
DISPOSABLE RODENT TRAP

Aramynta West-Harron, Heyatawin Lodge, 189 Chelton Rd., Manitou Springs, Colo. 80828

Filed May 15, 1981, Ser. No. 264,102
Int. Cl.³ A01M 23/32
U.S. Cl. 43—81 3 Claims



1. In a rodent trap having:

a base member;

a pivotal jaw attached to the base member; and

spring means operably connected with the jaw for biasing the jaw into a first position; the improvement comprising:

at least three anchor means attached to the top side of the base member;

an endless loop bait-carrying trigger cord slidingly engagably held by said anchor means where the bait being carried by the cord is disposed at a position forward of the

spring means and where at least one of said anchor means is disposed rearwardly of the spring means and positioned so as to bring said cord into contact with the jaw to maintain the jaw in a second position against the force of the spring means.

4,403,439

INTEGRAL FISHING ROD, HANDLE AND REEL SEAT

Leonard D. Wallace, 1 S. Strawberry St., Philadelphia, Pa. 19106

Filed Apr. 13, 1981, Ser. No. 253,334
Int. Cl.³ A01K 87/00
U.S. Cl. 43—18.1 5 Claims

1. An integral fishing rod, handle and reel seat, said rod comprising an elongated rod having a distal end, said handle and reel seat comprising an elongated one-piece cylindrical member formed of a plastic material and having a front end in the form of a reel seat and a rear end in the form of a gimbal butt, said rod being permanently secured to said handle by molding said handle and reel seat in situ on the distal end of said rod to form a solid bodied handle with the distal end of the rod extending into and secured to the handle along substantially the entire length thereof to a point immediately adjacent the gimbal butt to serve as reinforcement for the handle.

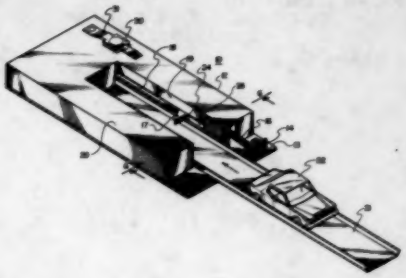
4,403,440

TOY VEHICLE ACCELERATOR

Virgil W. Wulff, Fullerton, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 19, 1981, Ser. No. 312,440
Int. Cl.³ A63H 33/00, 29/00
U.S. Cl. 46—1 K 7 Claims

1. A toy vehicle accelerator comprising a track piece; a pair of essentially parallel walls on opposite sides of the track piece separated by a distance selected to fit a particular size of toy vehicle; an impeller rotatably positioned to intrude over the track piece, the impeller being mounted to rotate freely in a horizontal plane and having first and second surfaces arranged so that when the first surface contacts the front or rear of a selected toy vehicle placed on the track piece the second



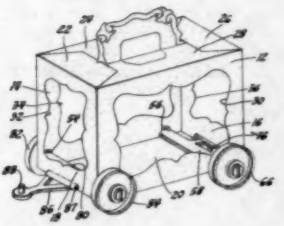
surface contacts a side of the vehicle; and means for moving the impeller along the track piece.

4,403,441

MEAL BOX ASSEMBLY

David L. White, and Beverly A. White, both of 7777 Mohrle, Fowlerville, Mich. 48836

Filed Jul. 20, 1981, Ser. No. 284,942
Int. Cl.³ A63H 33/00
U.S. Cl. 46—11 4 Claims



1. A combination comprising:

a collapsible meal box formed of a paperboard and having a base and a pair of spaced parallel sidewalls foldably secured along opposite sides of the base;

means rendering the base movable along a predetermined path of motion upward to a position between said sidewalls as they are moved toward one another to collapse the box;

an elongated axle member, and means supporting the ends of the axle member on the sidewalls of the box such that the axle member is disposed in the path of motion of the base to prevent the sidewalls from being moved one toward the other;

the sidewalls having a pair of aligned openings adjacent the base, the axle member extending through the openings in the sidewalls, and said axle member including means having a diameter larger than said sidewall openings mounted on the ends of the axle member within said box for abutment with the inner surfaces of said sidewalls when said box is in an erected position.

4,403,442
EXTENDABLE NAILS FOR DOLLS

Josephine Blanco, and Jeanne M. Blanco, both of 2460 Brice Rd., Akron, Ohio 44313

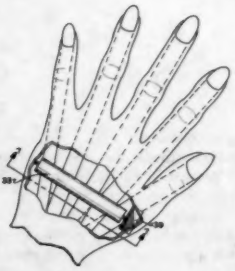
Filed Oct. 14, 1981, Ser. No. 311,199
Int. Cl.³ A63H 3/36
U.S. Cl. 46—163 8 Claims

1. A doll having extendable nails, comprising:
a doll body having hollow fingers, hands, toes and feet;
nail material disposed within said fingers and toes for forming nails thereon;
a pair of nail tracks positioned on either side of a respective said finger or toe through which slides and which frictionally secures the associated nail material;
means for extending said nails including at least a pair of pinch rollers secured within said hand or foot of said doll;
an electric motor driving said pinch rollers;
a battery to power said motor; and
a switch to activate and deactivate said motor.

4,403,443
FLOWER POT DEVICE

Nicola J. Valente, Minnesota Ave., North Greenbush, N.Y. 12144

Filed Sep. 28, 1982, Ser. No. 425,449
Int. Cl.³ A01G 13/00
U.S. Cl. 47—32 10 Claims



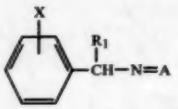
1. A device for use with a conventional flower pot to prevent spillage of soil in the event the flower pot is knocked over but to allow air circulation, watering and fertilizing of a potted house plant in said flower pot; said device comprising mounting brackets and a circular member, said mounting brackets having adhesive backings for removably affixing said mounting brackets to said flower pot, said mounting brackets having a plurality of spaces for receiving and adjustably mounting said circular member within said flower pot at a plurality of vertical positions from the top of said flower pot, and said circular member having a screened portion of open-mesh design to prevent such soil spillage, but to allow such air circulation, watering and fertilizing of such potted house plant.

4,403,444
SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 170,506, Jul. 21, 1980, Pat. No. 4,317,310, which is a division of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Dec. 7, 1981, Ser. No. 327,975
Int. Cl.³ A01C 1/06
U.S. Cl. 47—57.6 2 Claims

1. Sorghum seeds, the plants grown from which are resistant to injury by alachlor herbicide comprising crop seed coated with a safening effective amount of a compound of the formula

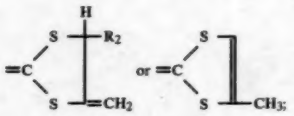


or an agriculturally acceptable acid addition salt thereof, wherein

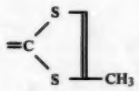
R_1 is hydrogen or methyl;

X is hydrogen, lower alkyl or lower alkoxy;

A is



R_2 is hydrogen or methyl;
provided that when A is

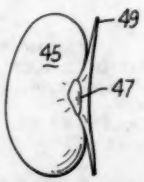


X must equal hydrogen.

4,403,445
METHOD OF SELECTING STRINGLESS BEANS

Calvin R. Lamborn, Twin Falls, Id., assignor to Sandoz, Ltd., Basel, Switzerland

Filed Oct. 8, 1981, Ser. No. 309,590
Int. Cl.³ A01H 1/04
U.S. Cl. 47—58 2 Claims



1. A method of improving seed bean stock to increase the percentage of stringless beans therein comprising:
separating from a lot of bean seeds, those seeds which have a placenta from those seeds which do not have a placenta

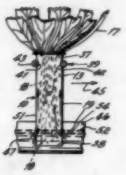
and maintaining those seeds which have a placenta as improved breeding stock for stringless green beans.

4,403,446

HYDROPONIC GROWING MEDIUM AND METHOD

Richard E. Wolfe, and Marvin G. Fiechtner, both of Cincinnati, Ohio, assignors to The Stearns & Foster Company, Cincinnati, Ohio

Filed Jul. 13, 1981, Ser. No. 282,946
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—58 4 Claims



1. A method of hydroponically growing a plant, said method comprising the steps of

providing an elongated element of non-biodegradable fibers, said element having an exterior shell that surrounds the internal fibers which is formed from the outermost layer of said fibers by melting the outermost layer of said fibers, said internal fibers being oriented generally axially of said element, said fibers being adapted to provide capillary transfer of a nutrient solution from one end of said element to the other end of said element, said fibers selected from the group consisting of polypropylene, polyethylene terephthalate, nylon, acrylic, polyvinyl acetate, and mixtures thereof, said elongated element having a bending length at least about 50% greater than the bending length of the fiber sliver or fiber two from which said element is produced, said internal fibers having a bulk density between about 0.02 grams per cc and about 0.10 grams per cc, and said internal fibers having a denier of less than about 100,

orienting said elongated element in a generally vertical fashion,

gripping said elongated element between its ends for restraining said element in said generally vertical orientation, said gripping being accomplished by partially deforming said element upon insertion of that element in a generally V-shaped clamp so that said element's one end is above said clamp when said element's other end is immersed in said solution, said element initially being restrained within said clamp due to the deformation of said element by said clamp,

seating a seed on said element's one end, said one end having a surface area substantially greater than the cross-sectional are of said seed, and

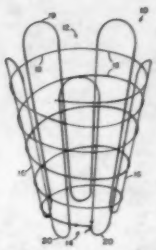
immersing said element's other end in a nutrient solution, said shell cooperating with said plant's root system during growth of said plant so as to direct said root system from said element's seat end toward said element's nutrient solution end while confining said root system interiorly of said element within said shell substantially throughout that section of said element not exposed to said nutrient solution, said interior confinement being in response to the structural integrity provided by said element's shell, the immersion lasting for a sufficient time period to permit and promote root growth within said element as well as exterior to said element, but the exterior root growth occurring only at that end of said element immersed in the nutrient solution.

4,403,447

WIRE BASKET, APPARATUS AND METHOD

Peter Braun, 58 Pleasant Ave., Hamilton, Ontario, Canada (L9C 4M8)

Filed Aug. 17, 1981, Ser. No. 293,607
Int. Cl.³ A01G *23/04*
U.S. Cl. 47—76 5 Claims



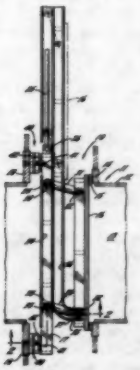
1. A wire basket for holding the root system of a plant in a ball of earth, comprising a single continuous strand of wire having a first portion forming a tubular cage consisting of back and forth bight strands and a second portion forming a helically coiled grid overlying the bight strands and welded thereto at the crossing points.

4,403,448

APPARATUS FOR CLOSING AND SEALING A DOORWAY

M. Kenneth Lesher, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Dec. 18, 1981, Ser. No. 331,974
Int. Cl.³ E05D *15/10*
U.S. Cl. 49—225 5 Claims



1. Door apparatus for selectively closing and sealing a doorway in a wall, said door apparatus comprising a main support, a carrier having inner and outer sides, and a door on the inner side of said carrier, means mounting said carrier for back and forth movement on said support and enabling said carrier to move said door between open and closed positions relative to said doorway, said carrier and said door shifting back and forth along a path substantially parallel to the plane of the doorway as said carrier moves said door between said open and closed positions, means mounting said door on said carrier and enabling said door to shift inwardly and outwardly relative to said carrier and into and out of sealing engagement with said

wall and sealing relationship with said doorway when said door is in said closed position, and bearing means for supporting said carrier with rolling friction as said carrier moves said door between said open and closed positions and for sustaining the outward force imposed on said carrier when said door is shifted inwardly into sealing engagement with said wall, said door apparatus being characterized in that said bearing means comprise a substantially spherical ball engageable with the outer side of said carrier, and means on said support and guding said ball to roll back and forth through a limited distance along a path substantially parallel to the path of said carrier while leaving said ball free to spin universally about is own center.

4,403,449

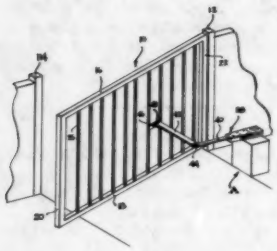
GATE-OPENING AND CLOSING APPARATUS AND METHOD

Moscow K. Richmond, 2819 Butler Ave., Los Angeles, Calif. 90066

Continuation of Ser. No. 126,717, Mar. 3, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,720

Int. Cl.³ E05F *11/24*

U.S. Cl. 49—340 **46 Claims**



1. An apparatus for swinging a gate in an arcuate path from a closed position with respect to an access opening to an opened position and from the opened position to the closed position, said apparatus comprising:

(a) housing means,

(b) motive means in said housing means,

(c) a drive shaft extending from said housing means and being rotatable by said motive means in both clockwise and counter-clockwise directions during normal operation,

(d) a drive arm respectively connected to said drive shaft and being rotatable thereby in both clockwise and counter-clockwise direction during normal operation,

(e) a lever arm means comprising:

(1) a first lever arm operatively coupled to said drive arm, and capable of being driven through an arcuate path upon operation of said motive means, and

(2) a second lever arm pivotally coupled to said first lever arm by a pivotal connection, said second lever arm also being operatively connected to said gate and moving through a somewaht arcuate path upon movement of said first lever arm,

(f) means associated with said drive arm to permit said first lever arm to be coupled thereto for arcuate movement with said drive arm and to permit coupling of the second lever arm to a gate for swinging same to an open position and to a closed position,

(g) shaft coupling means associated with said drive arm for coupling said drive arm to said drive shaft so that said drive arm is rotatable with said drive shaft when the motive means is operated, and

(h) disconnect means associated with said drive arm and being operatively connected to said shaft coupling means for disengaging said shaft coupling means from said drive arm to permit said drive arm to rotate independently of said drive shaft.

4,403,450

WINDOW REGULATOR FOR AN AUTOMOTIVE VEHICLE

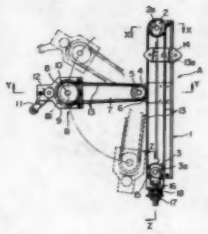
Kinichi Ishii, Yokohama, Japan, assignor to Kabushiki Kaisha Johnan Seisakusho, Japan

Filed Aug. 30, 1982, Ser. No. 412,992

Claims priority, application Japan, Sep. 2, 1981, 56-130418[U]

Int. Cl.³ E05F *11/48*

U.S. Cl. 49—352 **4 Claims**



1. A window regulator for an automotive vehicle comprising:

(a) a guide rail;

(b) first and second pulleys rotatably supported in a fixed spatial relationship along the guide rail;

(c) a link arm, one end of which is pivotably connected to the axle of the first pulley;

(d) a drum rotatably supported by the other end of the link arm;

(e) a drive wire, one end of which is fixed to the drum, then wound sequentially around the first pulley, around the second pulley, then around the first pulley again, and the other end of which is fixed to the drum, the opposite ends of the drive wires being wound around the drum in opposite directions; and

(f) a window bracket secured to the wire and slidably mounted on the guide rail, the window bracket being securable to a window pane.

4,403,451

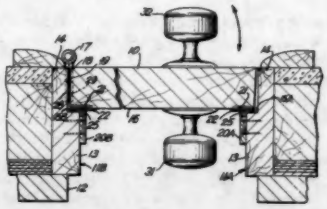
WEATHERSTRIPPING METHOD AND ARRANGEMENT

Roger R. Douillard, 66 Columbus Ave., Valhalla, N.Y. 10595

Filed Nov. 20, 1981, Ser. No. 323,561

Int. Cl.³ E06B *7/16*

U.S. Cl. 49—475 **10 Claims**



1. A weatherstripping arrangement for a door which is hinged to a door jamb on one side and closes against a door jamb on the other side comprising:

a separate elongated wooden lattice strip mounted to the door jamb on each side of the door at a predetermined

distance from the door when the door is in a closed position and a separate lattice strip mounted to the upper jamb at a spaced distance from the top of the door,

a lubricant applied to said door along the periphery of the closing face of said door on both sides and along the top thereof,

a tape strip positioned over said lubricant and removable therefrom, and,

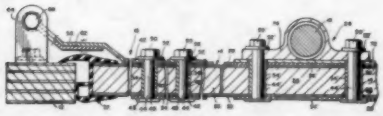
a silicone compound inserted between the tape strip and the edge of the wooden lattice strip with the door in a closed position, said compound flowing into the space between the jamb and door surface and wherein said silicone compound is allowed to harden in place to the lattice strip and door jamb to form a formfitting closure with the door.

4,403,452

HARDWARE ATTACHING MEANS FOR PANEL STRUCTURES

Burton A. Urbanick, LaGrange, Ill., assignor to Met-L-Wood Corporation, Chicago, Ill.

Filed Jun. 25, 1981, Ser. No. 277,268
Int. Cl.³ E06B 3/00
U.S. Cl. 49—501 **35 Claims**



1. A support assembly for attaching hardware to a panel structure having first and second exterior surfaces, comprising in combination:

a first doubler plate on one side of said panel structure in abutment with said first exterior surface;

a second doubler plate on the opposite side of said panel structure in abutment with said second exterior surface;

a hardware member engageable with the outside of said second doubler plate;

aperture means extending in alignment through said doubler plates, said panel structure and said hardware member;

fastening means engaging said first doubler plate and extending through said aperture means through said hardware member;

spacer means fixed to said hardware member and extending through said second doubler plate and said panel structure and into abutment with said first doubler plate to prevent excessive compression of said panel structure; and

securing means engageable with said fastening means on the outside of said hardware member to hold said support assembly in supporting relationship with said panel structure.

4,403,453

STYLUS CONING FIXTURE

Eric F. Cave, and James J. Cowden, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,577
Int. Cl.³ B24B 5/14
U.S. Cl. 51—124 R **12 Claims**

1. An apparatus for positioning the tip of a stylus adjacent a rotating scaife while continuously rotating said stylus comprising:

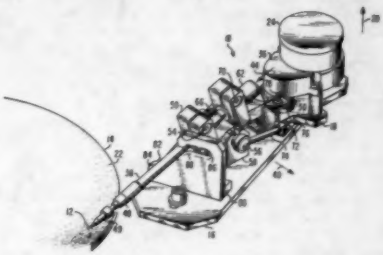
a platform adapted to be mounted adjacent said scaife,

a base plate connected to said platform by means for sweeping said plate through a sweep arc about a first axis orthogonal to the surface of said scaife,

a tube connected to said base plate by means for pivoting the tube about a second axis orthogonal to said first axis, said tube rotatably supporting a shaft adapted to rotate about a third axis oriented along the longitudinal axis of said tube, and positioned to allow one end of said shaft to move adjacent the surface of said scaife, said one end adapted to hold the shank of said stylus,

means mounted on said pivoting means and connected to the other end of said shaft for rotating said shaft about said third axis,

means supported by said base plate and connected to said pivoting means for exerting a constant torque about said second axis in a direction forcing the one end of said shaft toward the surface of said scaife, and



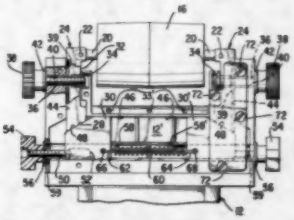
a ramp block mounted on said platform between said base plate and said scaife, said block having an inclined ramp oriented along a direction sufficiently orthogonal to said third axis to allow said tube to make contact therewith, while said stylus is positioned adjacent the surface of said scaife, and be lifted from the surface of said scaife when said sweeping means moves said plate through a portion of said sweep arc.

4,403,454

BELT SANDER

Thomas G. Glore, Easley, and Randy G. Koon, Pickens, both of S.C., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 30, 1981, Ser. No. 259,300
Int. Cl.³ B24B 21/00, 21/18
U.S. Cl. 51—135 BT **11 Claims**



1. Idler roll support and tensioning and tracking adjustment means for a belt sander having a die cast bed or frame, comprising: a pair of stamped metal yoke components adapted to be slidable in ways provided longitudinally in said die cast bed or frame and a pair of ramp members adapted to be slidable in transverse ways provided in said die cast bed or frame; each of said stamped metal yoke components comprise a generally U-shaped cross sectional configuration having a pair of legs, each leg having an aperture generally adjacent a forward end portion thereof to provide a pair of aligned apertures; a pivot pin received within said of aligned apertures for pivotally supporting an idler roll support shaft and an idler roll, each leg having rearward edges being angulated and defining ramp or camming surfaces for engaging contiguous and cooperating

ramp edges of one of said pair of ramp members for moving the yoke generally longitudinally forwardly and backwardly relative the bed or frame upon sideways movement of said ramp members; said support and tensioning and tracking adjustment means having means for selectively finely positioning said ramp members to obtain individual fine positioning, longitudinally of each of said yoke components, and means for locking each of said yoke components in selected fine positions.

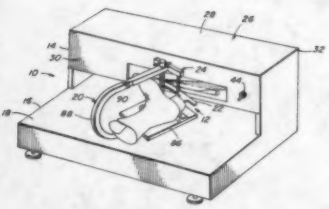
5. Belt sander comprising a die cast bed or frame, drive roll, an idler roll, an idler roll support shaft, and an idler roll support and tensioning and tracking adjustment means therefor, said support and tensioning and tracking adjustment means comprising: a pair of stamped metal yoke components slidable in ways provided longitudinally in said die cast bed or frame and a pair of ramp members slidable in transverse ways provided in said die cast bed or frame; each of said stamped metal yoke components comprise a generally U-shaped cross sectional configurations having a pair of legs spaced to receive an end of said idler roll support shaft, each leg having an aperture generally adjacent a forward end portion thereof to provide a pair of aligned apertures, said ends of said idler roll support shaft also having an aperture in alignment with said pair of aligned apertures of said yoke, a pair of pivot pins received within said aligned apertures for pivotally supporting said idler roll support shaft, each leg having rearward edges being angulated and defining ramp or camming surfaces for engaging contiguous and cooperating ramp edges of one of said pair of ramp members for moving the yoke generally longitudinally forward and backwardly relative the bed or frame upon sideways movement of said ramp members; said support and tensioning and tracking adjustment means further comprising means for selectively finally positioning said ramp members to obtain individual fine positioning, longitudinally, of each of said yoke components, and means for locking each of said yoke components in selected fine positions.

4,403,455

BELT GRINDER FOR SHARPENING ICE SKATE BLADES AND THE LIKE

Robert H. Chiasson, 1 Linden St., Maynard, Mass. 01754

Filed Apr. 10, 1981, Ser. No. 252,923
Int. Cl.³ B24B *21/10*
U.S. Cl. 51—141 **6 Claims**



1. Apparatus for grinding a workpiece such as a skate blade or the like, comprising

(a) an elongated and relatively straight platen;

(b) at least a pair of pulleys spaced from one another;

(c) power means drivingly connected to at least one of said pulleys;

(d) an endless abrasive belt looped about said pulleys in driving engagement therewith and against said platen;

(e) said pulleys disposed to guide said belt diagonally with respect to the length of said platen whereby a diagonal section of said belt will be presented at said platen to said workpiece;

(f) said platen being a shaft which rotatably supports a sleeve having a plurality of differently contoured working faces moveable into and out of working engagement with said belt; and

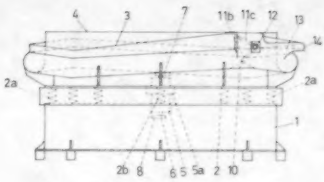
(g) a housing having a generally flat, straight bed extending parallel to said platen and a workpiece holder adapted to be moved along said bed to carry said workpiece lengthwise against that diagonal portion of said belt moving over said platen.

4,403,456

VIBRATORY BARREL FINISHING MACHINE

Hisamine Kobayashi, Nagoya, Japan, assignor to Shikishima Tipton Mfg. Co., Ltd., Nagoya, Japan

Filed Aug. 28, 1981, Ser. No. 297,168
Claims priority, application Japan, Sep. 12, 1980, 55-126803; Sep. 18, 1980, 55-132671[U]; Dec. 4, 1980, 55-174206[U]
Int. Cl.³ B24B *31/00*
U.S. Cl. 51—163.2 **18 Claims**



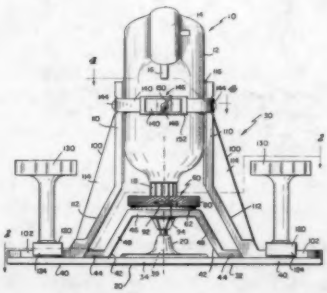
1. In a vibratory barrel finishing machine of the type having a single or multiple annular barrel structure of an elongated elliptical form in plan view including semi-circular barrel sections at the opposite ends thereof and straight longitudinal barrel sections running in parallel and connecting between the opposite semi-circular barrel sections, the barrel structure being adapted to have a vibratory motion to be supplied by vibration generating means such that the barrel structure under the vibration can allow the contents or mass therein to flow with a spiral motion through the barrel structure, said opposite semi-circular barrel sections each having a descending-slope path in the direction of the mass flow and said straight longitudinal barrel sections each having an ascending-slope path in the direction of the mass flow.

4,403,457

APPARATUS FOR SUPPORTING PORTABLE HAND TOOLS

Lowell B. Zerbe, 317 Sunset Dr., Columbus, Ind. 47201

Filed Feb. 9, 1981, Ser. No. 232,399
Int. Cl.³ B24B *23/02*
U.S. Cl. 51—170 T **12 Claims**



1. Apparatus for supporting a portable tool of the type having an outer casing and a chuck adapted to receive a tool attachment, comprising a base member having a longitudinal

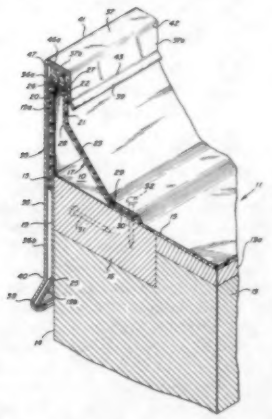
axis, a first opening formed in the base member and having a central axis at generally a right angle to the longitudinal axis of the base member, a guide member mounted on the base member, the guide member including a bridge section in spaced relationship to the first opening, a second opening formed in the bridge section having a center generally located on the central axis of the first opening, an adjustment member on the bridge section providing at least one groove extending radially with respect to the second opening, at least one finger radially movable in the groove into close proximity to the chuck, means for moving the finger to adjust the size of the second opening to receive chucks of various sizes, the bracket means for engaging the casing to support the tool, the bracket means being movable on the base member to adjust the position of the tool relative to the central axis of the first opening, and means for securing the bracket means to the base member in selected positions to support the tool.

4,403,458

CONJOINT FACIA

Ted E. Lolley, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed Jul. 31, 1981, Ser. No. 289,087
Int. Cl.³ E04D *13/15*
U.S. Cl. 52—60 **16 Claims**



1. In a conjoint facia, hood and water dam, the combination which includes; dam and first engagable means comprising, dam means having longitudinal ridge structure which includes upwardly extending laterally opposite forward and rearward sides and top lateral end means, and said dam means adapted to be on a roof deck of a building and installed adjacent to a wall of said building for sustaining said ridge structure in a substantially fixed position above said roof deck and supporting sheet roofing having a rearward lower portion of said sheet roofing lead from said roof deck at the rear of said dam means and an upper portion of said sheet roofing extend over said top lateral end means of said ridge structure to be covered, and first engagable means adapted to be in a position adjacent to said building wall and below said ridge structure; facia and hood means including at least one facia and hood member and said facia and hood member comprising, facia means to be disposed frontally of said dam means and said wall of said building, second engagable means connected with said facia means, and hood structure to cover said ridge structure and said upper portion of said sheet roofing on said top lateral end means of said ridge structure, said hood structure having a downwardly extending forward wall, and a rearward portion lowermost to be spaced stably upwardly free of said lower portion of said sheet roofing, said rearward portion comprising a downwardly extending rearward wall laterally opposite said forward wall, and said first engagable means and said second engagable means together including tongue means and grooved means for said tongue means and said grooved means to be engaged and said first engagable means including detaining means for movement of said facia and hood member in an upward direction relatively to said dam and first engagable means to be stopped, said tongue means to be received leading in a direction which intersects with horizontal into said grooved means during upward movement of said facia and hood member, to engage said tongue means and said grooved means laterally interlockingly and maintain said facia means horizontally laterally restrained; and resilient biasing means; said facia and hood member in being installed being downwardly and then upwardly moved with said downwardly extending laterally opposite forward and rearward walls of said hood structure being laterally outside said upwardly extending laterally opposite forward and rearward sides of said ridge structure, and said resilient biasing means being inside said hood structure and abutting said hood structure while over said upper portion of said sheet roofing on said top lateral end means of said ridge structure and pressed during said downward movement of said facia and hood member, for clamping said sheet roofing against said top lateral end means of said ridge structure and enabling said tongue means and said grooved means to be aligned for being engaged in response to upward movement of said facia and hood member meanwhile having said hood structure cover said upper portion of said sheet roofing, and for said biasing means reactively to bias said facia and hood member to effect said upward movement of said facia and hood member with said tongue means and said grooved means engaged until said facia and hood member is stopped by said detaining means, thereafter having said downwardly extending laterally opposite forward and rearward walls of said hood structure still laterally outside said upwardly extending laterally opposite sides of said ridge structure and said hood structure still covering said upper portion of said sheet roofing, said tongue means and said grooved means still engaged, and said biasing means still clamping said upper portion of said sheet roofing against said top lateral end means of said ridge structure and reactively urging said facia and hood member in an upward direction to maintain said hood structure stable with said rearward portion of said hood structure meanwhile being lowermost stably spaced upwardly free of said lower portion of said sheet roofing.

4,403,459

BENCHMARK FOR USE IN ARCTIC REGIONS

Roy B. Hurlbut, Vancouver, Wash., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Filed Jan. 27, 1981, Ser. No. 228,815
Int. Cl.³ E01F *9/02*; E04H *13/00*
U.S. Cl. 52—103 **4 Claims**

1. A benchmark for an arctic region having an active surface layer which partially thaws and then refreezes over prolonged periods, said benchmark comprising:

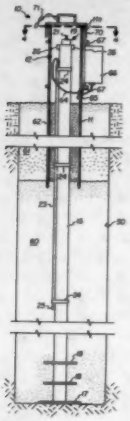
a casing set through said active layer and into the layer underlying said active layer;

a marker element extending completely through said casing and into said underlying layer, said marker element comprising:

a length of pipe; and

a reference element mounted on the upper end of said pipe; and

fluidic material in said casing around at least that portion of said marker element that pass through said active layer,



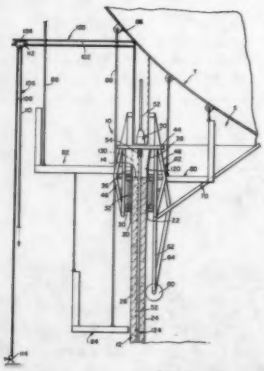
said fluidic material being material which does not freeze under ambient conditions.

4,403,460

METHOD OF ERECTING AN ELEVATED TANK USING FORMWORK

Richard E. Hills, Coraopolis, Pa., assignor to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1981, Ser. No. 307,640
Int. Cl.³ E04H *12/30*
U.S. Cl. 52—745 **14 Claims**



1. A method of erecting an elevated tank comprising steps of:

positioning a tank support means on a ground located footing;

forming a tank on said ground-mounted tank support means;

attaching formwork apparatus to said tank, said formwork apparatus including a plurality of jacking mechanisms, said jacking mechanisms being connected to said tank;

forming a support wall using formwork apparatus; and

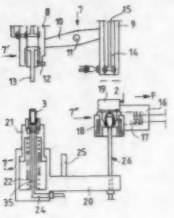
elevating said tank simultaneously with said support wall formation using said formwork jacking mechanisms to lift said tank as said wall is formed, said tank remaining coupled to said support wall via said formwork apparatus during formation of said support wall and being carried upwardly by said support wall as said support wall moves upward during formation thereof.

4,403,461

DEVICE FOR SEALING HARD GELATIN CAPSULES AND FOR PACKING A LIQUID PRODUCT DOSE IN THE THUS SEALED CAPSULE

Rene-Michel Goutard, Verrieres-le-Buisson, and Pierre Piry, Briis sous Forges, both of France, assignors to Automatisme et Technique, Arcueil and Laboratoires Sophartex, Vernouillet, both of, France

Filed Feb. 19, 1981, Ser. No. 235,994
Claims priority, application France, Feb. 29, 1980, 80 04617; Apr. 18, 1980, 80 08787
Int. Cl.³ B65B *1/04, 51/02;* B67B *7/00*
U.S. Cl. 53—282 **4 Claims**

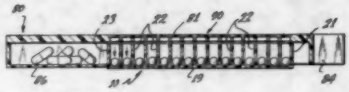


1. A device for sealing hard gelatin capsules comprising a capsule body fitted within a cap and packing in the capsules thus prepared products such as medicines, in granular, powder or liquid form, characterized in that it comprises a unit capable of rotating about a vertical axis and formed from three subassemblies spaced apart from top to bottom, the upper subassembly comprising essentially two vertical-movement slides (**8** and **9**), articulated together by means of a balance rod pivoting about a horizontal axis, a product-distributing piston sliding coaxially inside one of said slides (**8**) and extending downwards into a nozzle, whereas an adhesive-distributing piston slides coaxially inside the other of said slides (**9**), the intermediate subassembly being formed essentially by a horizontally movable slide (**16**) integral with an abutment block, whereas a support (**17**) slides coaxially inside said slide (**16**) and carries a vehicle for carrying the capsule, the lower subassembly being essentially formed by a vertically movable support (**20**) supporting successively from the periphery of the device towards said vertical axis, in the first place a slide (**21**) able to move abuttingly upwards under the action of a spring, said lower subassembly slide (**21**) comprising at its upper end a housing able to be connected to a vacuum line for removing the capsule body from said capsule carried in said vehicle and leaving said cap in said vehicle, and said slide (**21**) comprising a coaxial pushrod, in the second place a vertical finger for sensing the presence of said cap within said vehicle, in the third place an adhesive pick-up and transfer member, this member presenting an essentially vertical orientation, the housing at the upper end of said slide (**21**) being, by construction, placed in vertical alignment with said nozzle, whereas the adhesive take-up and transfer member is, by construction, placed in vertical alignment with the axis of said other of said slides (**9**), and during a single filling and sealing cycle said vehicle is brought by the movement of said horizontally moving slide (**16**) and support (**17**) respectively into vertical alignment with said housing, into vertical alignment with said finger and into vertical alignment with the adhesive pick-up and transfer member to thereby apply adhesive from said transfer member to said cap and reinsert said body into said cap.

4,403,462
PLASTIC PILL BOX AND ASSOCIATED LOADING APPLIANCE

Frank Halbich, 16123 Valeria St., Van Nuys, Calif. 91402

Division of Ser. No. 34,471, Apr. 30, 1979, Pat. No. 4,253,572.
This application Aug. 12, 1980, Ser. No. 177,383
Int. Cl.³ B65B 67/02, 35/32
U.S. Cl. 53—392 7 Claims

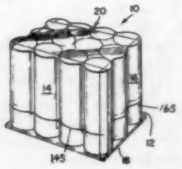


1. A multi compartment container for pills and alike, the container being defined by side, end, and bottom walls of material, means defining partitions within the container defining a plurality of individual open top compartments each adapted to receive a product, integral cover means configurated to fit onto the container, and to form a top closure for the individual compartments, said cover including a plurality of individual sections each shaped to provide a closure, for an individual compartment and each section including a frangible part connecting it to the cover whereby each individual section can be broken free of the cover in order to open and uncover an individual compartment, the improvement including a loading appliance for the container, the said appliance being in the form of a receptacle having a retaining surface, the retaining surface having a plurality of spaced recesses, the said surface having flat areas adjacent to the recesses, the spacing corresponding to the spacing of the said individual compartments, the recesses being shaped to receive the pills to be placed in the container, the receptacle having a top opening shaped for the placing of pills on said flat areas whereby pills can be put into the receptacle and caused by agitation of the receptacle to align themselves into the recesses, the receptacle being shaped to have the container positioned relative to it in a position whereby all of the pills can be caused to transfer from the recesses into individual compartments of the container.

4,403,463
PACKAGING IN EXTENSIBLE BANDS

Bernard R. Danti, Six Alfred Cir., Bedford, Mass. 01730

Continuation-in-part of Ser. No. 88,609, Oct. 26, 1979, Pat. No. 4,304,332. This application May 13, 1980, Ser. No. 149,346
Int. Cl.³ B65B 21/24
U.S. Cl. 53—398 7 Claims



1. A process for packaging articles snugly within extensible hoops formed of stretchable polymeric film, said process comprising the steps of:

(a) inserting a plurality of mechanical spreader means within a said hoop while it is in a non-extended position;

(b) contacting extensible portions of said hoop only with surfaces of each of said spreader means which are freely rotatable about an axis parallel to the direction of insertion;

(c) moving said plurality of rotatable spreader means away from each other in a direction perpendicular to the direction of insertion to an extended position thereby causing each of said spreader means to freely rotate in response to the stress exerted by said film on said spreader means surfaces to thereby uniformly stretch said hoop;

(d) placing an article within said hoop;

(e) moving said spreader means from said extended position to allow said stretched hoop to relax into snug contact with portions of the surface of said article to be packaged; then,

(f) removing said spreading means from within said hoop.

4,403,464
ACRYLIC COATED/POLYVINYLIDENE CHLORIDE COATED POLYOLEFIN FILM

Gary L. Duncan, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 73,830, Sep. 10, 1979, abandoned, which is a division of Ser. No. 909,426, May 25, 1978, abandoned, which is a continuation of Ser. No. 711,910, Aug. 5, 1976, abandoned. This application Apr. 9, 1981, Ser. No. 252,698
Int. Cl.³ B65B 51/10; B32B 27/08
U.S. Cl. 53—452 12 Claims

1. A method of making a package for a product from a single-ply oriented polyolefin film having a heat sealable acrylic-based coating on one side; and a heat sealable polyvinylidene chloride-based coating on the other side comprising:

forming said package from said film with said polyvinylidene chloride-based coating facing inwardly, and with said acrylic-based coating facing outwardly, and

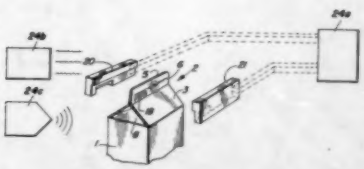
heat sealing said film about said product;

wherein said acrylic-based coating consists essentially of an interpolymer of an alpha-beta monoethylenically unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, and mixtures thereof, and neutral monomer esters selected from methyl acrylate, ethyl acrylate and methyl methacrylate; and wherein said polyvinylidene chloride-based coating consists essentially of an interpolymer of vinylidene chloride, an alpha-beta ethylenically unsaturated carboxylic acid selected from acrylic acid, methacrylic acid and mixtures thereof and an ethylenically unsaturated monomer selected from methyl acrylate, ethyl acrylate and mixtures thereof.

4,403,465
METHOD AND DEVICE FOR CLOSING AND SEALING GABLE SHAPED FOLDING CARTONS

George L. Bachner, Barrington, Ill., assignor to Nimco Corporation, Crystal Lake, Ill.

Continuation of Ser. No. 145,776, May 2, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,453
Int. Cl.³ B65B 51/14
U.S. Cl. 53—477 12 Claims



1. In an apparatus for sealing a package having a gable shaped closure, the gable shaped closure having marginal areas forming a sealing truss, the apparatus having jaw means for applying force externally on said marginal areas while the temperature of said marginal areas is elevated to thereby seal the package, the improvement comprising jaw means having a pair of jaws with multiplanar surfaces, each of said jaws having a first planar surface for engaging a first thickness of package material, a second planar surface, recessed from the first planar surface, for engaging a second thickness of package material, a

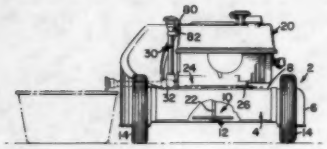
third planar surface, recessed from the second planar surface, for engaging a third thickness of package material, and a fourth planar surface, recessed from the third planar surface, for engaging the third thickness of package material, whereby less force is exerted on the third thickness of package material corresponding to relieved portions engaged by the fourth planar surface of the multiplanar surfaces of said jaw means.

4,403,466

LAWN MOWER ENGINE OIL DRAIN

Henry B. Tillotson, Minneapolis; Richard A. Thorud, Bloomington, and James R. Baumann, St. Louis Park, all of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed May 6, 1982, Ser. No. 375,421
Int. Cl.³ A01D *35/26;* **B67D** *5/00;* **F01M** *11/04*
U.S. Cl. 56—16.7 **9 Claims**



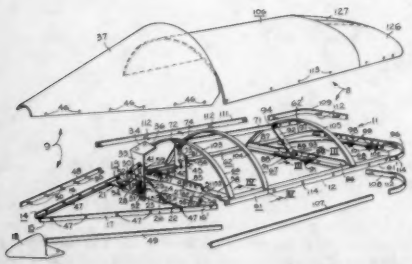
1. An improved lawn mower, which comprises:
(a) a housing;
(b) means for movably supporting the housing for movement over the ground;
(c) a cutting element carried on the housing for severing ground growing vegetation;
(d) an internal combustion engine carried on the housing for powering the cutting element, the engine having an oil sump for containing oil and an elongated tube connected to the sump for filling the sump with oil; and
(e) means for movably connecting the tube to the sump for movement between a first position in which the tube is substantially vertical relative to the housing and a second position in which the tube is substantially horizontal relative to the housing, whereby the tube in its second position enables the easy draining of oil from the sump.

4,403,467

ROW DIVIDER WITH FLEXIBLE PLASTIC SHEATH

Robert T. Baugh, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sep. 29, 1982, Ser. No. 426,985
Int. Cl.³ A01D *45/02*
U.S. Cl. 56—119 **7 Claims**



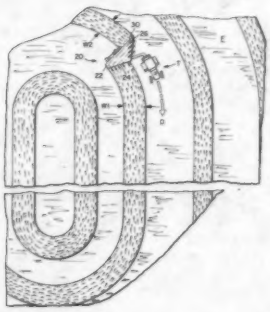
1. In a row crop harvester having a frame with a transverse beam and a plurality of row units releasably mounted on said beam at lateral spacings therebetween to conform to the row spacings of crops being harvested, the combination comprising:
a longitudinally extending divider structure between adjacent row units having
a longitudinally extending, adjustable with hood including
a flexible plastic sheath having a cylindrical portion formed by bending a single integral sheet of flexible plastic, said cylindrical portion bowing upwardly and extending between said adjacent row units and
means releasably connecting laterally opposite sides of said hood to said adjacent row units, said flexible cylindrical portion bowing upwardly at different curvatures when said adjacent row units are mounted on said beam at different row spacings.

4,403,468

SWATH TURNING MACHINE

Kermit L. Yoder, R.D. 1, Box 174, Accident, Md. 21520

Filed Jun. 10, 1982, Ser. No. 387,042
Int. Cl.³ A01D *79/00*
U.S. Cl. 56—370 **27 Claims**



1. A swath turning machine comprising:
a frame including a first edge and a second edge,
a wheel means rotatably attached to said frame whereby said frame can be moved in a first direction of travel,
a pick-up means disposed along said first edge for engaging swaths lying on the ground and depositing said swaths on said frame,
a moving means connected to said frame for moving said deposited swaths from said first edge to said second edge,
said moving means moving the swaths between said first edge and said second edge in a direction perpendicular to said first direction of travel,
said second edge being spaced above the ground,
said second edge defining an obtuse angle with said direction of frame travel, and
a turning means for moving said swaths in a direction generally perpendicular to said first direction of travel from said second edge to the ground, said turning means turning said swaths over as said frame moves in said first direction of travel and as said swaths are moved from said second edge to the ground.

4,403,469

COMBINE TOOTH AND MOUNTING THEREFOR

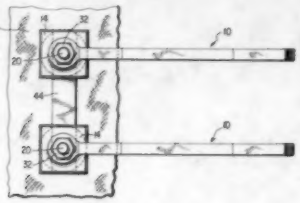
Walter D. Hofer, 926-7 A St. S., Lethbridge, Alberta, Canada

Filed Apr. 5, 1982, Ser. No. 365,282
Int. Cl.³ A01D *77/08*
U.S. Cl. 56—400 **5 Claims**

1. A combine tooth and mounting adapted for use on a combine belt comprising:
a tooth having a base portion and a tine portion, said base portion having a through bore extending from the bottom to the top thereof, at least the lower portion of said bore

being of square cross-sectional configuration, the bottom face of said base portion having a transversely extending recess, said tine portion projecting at an angle from one side of said base portion;

a friction plate of a length such as to extend between adjacent teeth positions on said combine belt and including, at each tooth position, a portion the configuration of which is complementary to that of said recess, said plate having a square hole at each tooth position;



a bolt having an enlarged, substantially planar head, a first shank portion of square cross-sectional configuration and a further threaded shank portion; and

a nut threadable onto said further shank portion; the arrangement being such that, when said combine tooth is mounted on said combine belt, the shank portions of said bolt extend through said belt, said friction plate, said tooth base portion and said nut, in sequence, said belt being clampingly engaged between said bolt head and said friction plate.

4,403,470

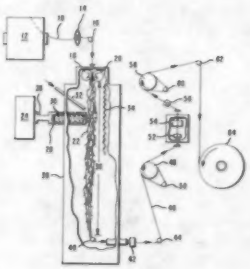
PROCESS FOR MAKING COMPOSITE YARN OF CONTINUOUS FILAMENTS AND STAPLE FIBERS

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1981, Ser. No. 335,643

Int. Cl.³ D02G *3/38, 3/42*

U.S. Cl. 57—5 **4 Claims**



1. In a process for making a composite yarn of staple fibers commingled with continuous filaments including the steps of passing a feed yarn of continuous filaments which is under tension and substantially free of twist and filament entanglement through a nip formed by a pair of counter rotating rolls which advance the yarn to a splaying zone in air wherein the filaments are splayed into an open network and airborne staple fibers are projected from a source angularly into the open network to combine and commingle with the continuous filaments after which the open network is collapsed into said composite yarn, the improvement which comprises creating said open network of continuous filaments by passing through said nip region as the feed yarn a yarn of crimped continuous filaments of a synthetic organic polymer which filaments individually contract from crimp retractive forces substantially immediately upon passing through said nip region and splay of their own accord into an open three-dimensional filament network which continues to travel in a substantially linear direction at a slightly reduced speed and projecting said staple fibers into said three-dimensional network.

4,403,471

BOBBIN EXCHANGE APPARATUS ON A RING SPINNING OR RING TWISTING MACHINE

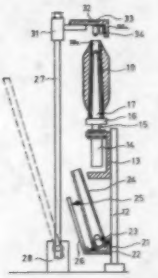
Peter Oswald, Matzingen, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Aug. 24, 1981, Ser. No. 295,837

Claims priority, application Switzerland, Sep. 15, 1980, 6901/80

Int. Cl.³ D01H *9/08, 9/14*

U.S. Cl. 57—274 **13 Claims**



1. A bobbin exchange apparatus on a ring spinning or a ring twisting machine equipped with bobbin spindles, said bobbin exchange apparatus comprising:

a transporting belt;

a plurality of bobbin holders provided for said transporting belt and serving for taking-up bobbin tubes;

said bobbin holders being arranged at a mutual distance from one another essentially corresponding to the spindle gauge of the bobbin spindles of the machine;

said transporting belt extending in the longitudinal direction of the machine;

said transporting belt, viewed relative to the machine, being positioned at an inclination downwardly towards a front side of the machine;

supporting means provided for said bobbin tubes;

said supporting means extending substantially in the longitudinal direction of the machine; and

said supporting means being positioned in front of the bobbin tubes placed upon the bobbin holders of the transporting belt and supporting said bobbin tubes.

4,403,472

METHOD OF CLEANING SPINNING ROTORS AND APPARATUS FOR CARRYING OUT THE METHOD

Andre Lattion, Seuzach, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jul. 29, 1982, Ser. No. 402,935

Claims priority, application Switzerland, Aug. 11, 1981, 5051/81; Jun. 11, 1982, 3631/82

Int. Cl.³ D01H *7/885*

U.S. Cl. 57—302 **16 Claims**

1. A method of cleaning spinning rotors for open-end spinning, wherein a rotor is located in a related rotor housing provided with a rotor housing opening for application of external suction, comprising the steps of:

opening the rotor housing of the rotor which is to be cleaned;

mounting a cleaning device containing a rotatable blower head upon said rotor housing in order to cover the opened rotor housing;

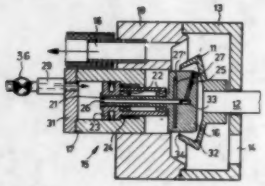
during mounting of the cleaning device upon the rotor housing forming between an end face of the rotatable blower head and a free edge of the rotor an annular gap located between substantially parallel planes;

bringing the rotor to standstill prior to generating at least one rotatable air jet by means of the rotatable blower head of the cleaning device and which air jet essentially impinges a collecting groove of the rotor;

sucking air from the rotor housing through the internal space of the rotor during a suction operation; and

thereafter immersing the rotatable blower head into the internal space of the rotor and placing such rotatable blower head into rotation, to thereby form the rotating air jet while maintaining the suction operation.

7. A cleaning device for cleaning spinning rotors for open-end spinning, comprising:



a cleaning cover which can be placed upon a rotor housing of a rotor having an axis of rotation and which rotor is to be cleaned;

said cleaning device containing a rotatable blower head having an axis of rotation;

said axis of rotation of the rotatable blower head substantially coinciding with the axis of rotation of the rotor;

a suction channel leading through said cleaning cover;

means mounting said blower head to be movable essentially parallel to its axis of rotation from a first working position, where an end face thereof is directed towards the rotor and forms with a free edge of the rotor a substantially annular gap, into a second working position where the blower head extends into the internal space of the rotor;

said blower head being provided with at least one cleaning channel serving for the generation of an air jet;

means providing a compressed air line serving for the selective infeed of compressed air to said cleaning channel; and

said cleaning channel being operatively connected in flow communication with said compressed air line.

4,403,473

AMMONIA/FUEL RATIO CONTROL SYSTEM FOR REDUCING NITROGEN OXIDE EMISSIONS

John R. Gladden, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00845, § 371 Date Jun. 22, 1981, § 102(e) Date Jun. 22, 1981, PCT Pub. No. WO83/00057, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 22, 1981, Ser. No. 287,543

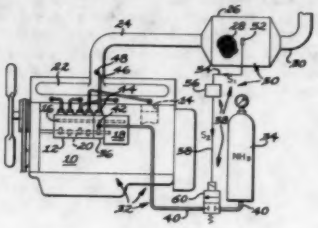
Int. Cl.³ F01N *3/20, 3/36*

U.S. Cl. 60—274 **13 Claims**

1. A method of reducing the amounts of oxides of nitrogen contained in a combusted gas stream from an engine combustion chamber, comprising the steps of:

conducting the combusted gas stream to a reactor; and

metering ammonia to the combusted gas stream at a location between said combustion chamber and said reactor in a preselected proportion to the fuel mass flow rate supplied to said engine combustion chamber wherein the step of metering ammonia includes the step of metering the



amount of ammonia in response to a fuel pump rack position and engine speed.

4,403,474

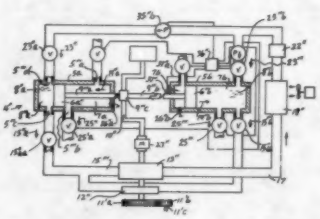
HYDROLIC FLUID-LUBRICATED PISTON-COMBUSTION ENGINE

William A. Ruthven, 170-C Manchester Dr., Basking Ridge, N.J. 07920

Filed Apr. 13, 1981, Ser. No. 253,185

Int. Cl.³ F04B *17/00*

U.S. Cl. 60—396 **9 Claims**



1. A combustion engine comprising in combination: a combustion piston chamber means that forms at least one elongated chamber therein for the mounting therein of a reciprocable piston, with at least one fuel inlet port and exhaust outlet port positioned to be in flow communication with one end of the elongated chamber, and with at least one set of hydraulic fluid inlet and outlet ports positioned to be in flow communication with a opposite end of the elongated chamber and with at least one piston port also positioned to be in communication with said piston within the elongated chamber; said reciprocable piston mounted within the elongated chamber with the piston positioned such that its substantially forward face thereof extends transversely across an axis of a longitudinal length of the elongated chamber and the piston being mounted to freely move to and fro reciprocably along a longitudinal axis of the elongated chamber; piston force means for transmitting force to and movement with said reciprocable piston through said piston port, responsive to a starter means; and said starter means being drivably connected to drive said piston force means adapted such that said piston moves reciprocably within the elongated chamber; liquid turbine means having at least one inlet thereof connected in closed communication with the hydraulic fluid outlet port; hydraulic fluid reservoir means for containing expanding and contracting volume of hydraulic fluid, having at least one reservoir inlet port and at least one reservoir outlet port, the reservoir inlet port being in flow-communication with the turbine outlet port, and the reservoir outlet port being in flow-communication through valve means with each of the hydraulic fluid inlet and outlet ports of the elongated chamber; space of said elongated chamber adjacent

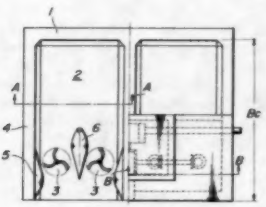
said one end being a combustion chamber, and space adjacent said other end being a hydraulic fluid chamber, said combustion chamber being segregated from said hydraulic fluid chamber by said reciprocable piston; hydraulic fluid being present in said hydraulic fluid chamber and in said reservoir and in communication lines connecting the hydraulic fluid chamber with the liquid turbine means and the reservoir means such that the hydraulic fluid serves as lubricant around sides of the piston facilitating reciprocal movement of the reciprocable piston and such that said hydraulic fluid drives said liquid turbine means when said reciprocable piston is moved toward said opposite end; said valve means being for channeling said hydraulic fluid from said hydraulic fluid outlet port through said liquid turbine means and thereafter to said reservoir inlet port and simultaneously preventing flow to said reservoir means from said hydraulic fluid inlet port as said reciprocable piston moves toward said opposite end, and for channeling said hydraulic fluid from said reservoir outlet port to said hydraulic fluid inlet port of the hydraulic fluid chamber and simultaneously preventing flow from said reservoir means through said turbine means to said hydraulic fluid outlet as said reciprocable piston moves toward said one end; and combustion means for injecting fuel into said combustion chamber through the fuel inlet port and for explosively igniting and burning fuel within said combustion chamber and for exhausting spent exhaust fumes from the combustion chamber through the exhaust outlet port.

4,403,475

WAVE ENERGY ABSORBER MOUNTABLE ON WAVE-FACING STRUCTURE

Hideo Kondo, Muroran, Japan, assignor to Muroran Institute of Technology, Hokkaido, Japan

Filed Sep. 9, 1980, Ser. No. 185,620
Claims priority, application Japan, Sep. 20, 1979, 54-120083
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—398 **6 Claims**



1. A resonant type apparatus for absorbing wave energy, said apparatus being an integral part of a fixed coastal structure, comprising

a caisson having

a rear wall secured to said fixed coastal structure, said rear wall facing the sea;

a bottom wall attached to the lower part of said rear wall and extending toward the sea;

at least two sidewalls attached to said rear and bottom walls, said rear wall being located between said side walls to form a water chamber open at the end facing the sea and at least partially open at the top, the length of said chamber being longer than one-quarter of the wavelength L_c of a standing wave in said water chamber, said standing wave having a node at a distance $L_c/4$ from said rear wall measured toward the open end of said water chamber;

a wave-power turbine impeller rotatably supported by said caisson at a position coinciding with the position of said node; and

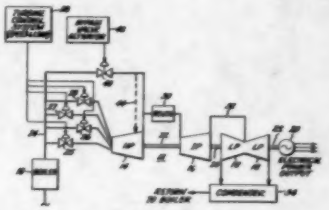
means for limiting the rotation of said impeller to a single direction, whereby the energy of waves incident on said caisson is absorbed by said impeller as rotational energy thereof.

4,403,476

METHOD FOR OPERATING A STEAM TURBINE WITH AN OVERLOAD VALVE

Lloyd H. Johnson, Scotia; Robert S. Couchman, Ballston Lake; Robert C. Spencer, Jr., Burnt Hills; John A. Booth, Scotia, and Russell J. Holman, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,697
Int. Cl.³ F01K *13/02*
U.S. Cl. 60—652 **11 Claims**



1. A method of operating a steam turbine delivering power to a connected load and adapted to receive steam from a steam generating source, the turbine having a plurality of control valves for controlling the admission of steam to higher pressure stages of the turbine and having a bypass overload valve connected to receive steam from the steam source and to discharge such steam to a power pressure stage of the turbine, said method comprising the steps of:

(a) maintaining said bypass overload valve closed while controllably positioning said control valves to admit steam to the turbine to sustain a preselected power load;

(b) increasingly opening said control valves with increasing load demand on the turbine until all valves of said plurality of control valves have reached a fully opened position;

(c) fully opening said bypass overload valve while substantially simultaneously controllably positioning at least one of said control valves toward a closed position sufficient to offset steam flow through said bypass overload valve in excess of that required to sustain the turbine load; and

(d) further increasing the power output of the turbine by controllably positioning said plurality of control valves toward said fully opened position.

4,403,477

AIR STORAGE INSTALLATION BLOWOUT PREVENTION DEVICE

Alfred Schwarzenbach, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

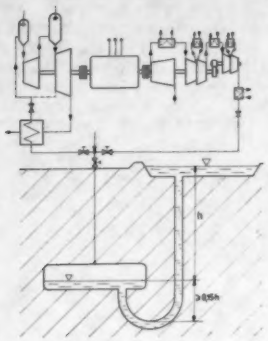
Filed Sep. 5, 1980, Ser. No. 184,382
Claims priority, application Switzerland, Sep. 7, 1979, 8078/79
Int. Cl.³ F02C *3/00*
U.S. Cl. 60—659 **4 Claims**

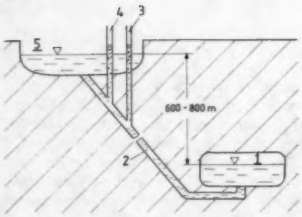
1. In a constant pressure air storage installation of a gas turbine power station of the type having a compressor and a gas turbine and a subterranean air storage cavity with connecting lines for supplying air from the compressor to the storage cavity and from the storage cavity to the gas turbine, a water basin at a higher level than the cavity, and a standpipe connecting the water basin to the subterranean cavity, the improvement wherein:

at least an upper portion of said standpipe is inclined with respect to the horizontal; and

said standpipe includes a ventilation pipe which is connected to, and in fluid communication with, said upper portion of

said standpipe to receive a water-air mixture forming during the charging of said air storage cavity, said ventilation pipe extending through the water basin with an upper





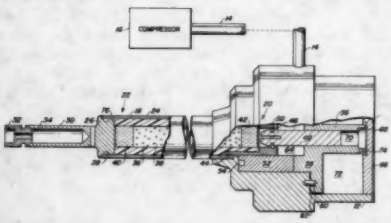
end of said ventilation pipe extending above the water level of said water basin to permit the venting of air from said water-air mixture thereby preventing a blowout of said air storage cavity.

4,403,478

EXPANDER STROKE DELAY MECHANISM FOR SPLIT STIRLING CRYOGENIC COOLER

Roland W. Robbins, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,355
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **38 Claims**



1. A split Stirling cycle engine refrigerating device, comprising:

an expander housing having a first second, and third compartment, each retaining a contained volume of gas, a gas inlet to vary the pressure on said first compartment, and an elongated displacer housing extending from said first compartment for gas expansion and contraction as gas pressure varies therein;

an elongated regenerator displacer piston slidably situated within said displacer housing, extending into said expander housing for reciprocating movement therein;

a first seal between said expander housing and said displacer to seal gas within said housing while said regenerator displacer piston reciprocates therein;

a second seal within said expander housing to separate said first compartment from said second compartment;

a plunger attached to said elongated regenerator displacer piston, extending through said second seal to reciprocate therethrough as gas pressure varies in said first compartment; and

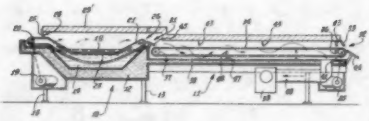
a cylindrical extension of said second seal, surrounding said plunger to separate said third compartment from said second compartment, having an orifice through the wall thereof to connect said second and third compartments.

4,403,479

QUICK FREEZING SYSTEM

Ivan Rasovich, 2653 E. Timberlake, La Crescenta, Calif. 91214, assignor to Ivan Rasovich, Pacomia, Calif.

Continuation-in-part of Ser. No. 182,961, Sep. 2, 1981, abandoned. This application Feb. 18, 1982, Ser. No. 349,989
Int. Cl.³ F25D *13/06*
U.S. Cl. 62—63 **13 Claims**



1. In a quick freezing system for food products and the like, the combination of:

an insulated tank containing a cryogenic liquid bath for quickly freezing items therein and having means defining an enclosed space over said tank with an inlet and an outlet;

an inlet receptacle at said tank inlet positioned for receiving cryogenic vapor from said tank, said receptacle including means for receiving atmosphereic air for mixing with the cryogenic vapor to form a gas mixture;

first duct means for withdrawing said gas mixture from said receptacle;

a temperature sensor for sensing the temperature of said gas mixture and providing a temperature signal;

an elongate, horizontally disposed insulated chamber having an inlet and an outlet, with said tank outlet positioned at said chamber inlet providing a vapor flow path in the zone between said tank and chamber;

a first conveyor belt in said tank for moving a product from said tank inlet to said tank outlet into and out of said liquid bath along a generally horizontal path;

a second conveyor belt in said chamber for moving a product through said chamber from said chamber inlet to said chamber outlet along a generally horizontal path with said tank outlet and chamber inlet disposed for transfer of product through said zone from said first conveyor belt to said second conveyor belt;

exhaust means coupled to said chamber adjacent said chamber outlet for drawing vapor from said tank through said zone and through said chamber and removing vapor from said chamber,

said exhaust means including second duct means between said chamber and the atmosphere and control means for controlling the flow through said second duct means as a function of said temperature signal; and

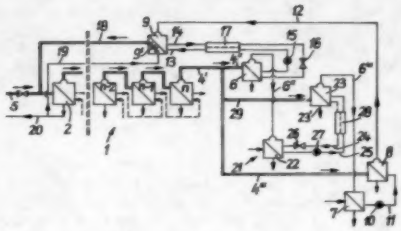
means connecting said temperature signal from said temperature sensor to said control means.

4,403,480

METHOD OF AND APPARATUS FOR RECOVERING HEAT ENERGY CONTAINED IN VAPORS OF MULTI-STAGE EVAPORATORS INSTALLED FOR THERMAL MATERIAL-SEPARATING PROCESSES

Paul Franzen, Koblenz, Fed. Rep. of Germany, assignor to Maschinenfabrik Buckau R. Wolf AG, Grevenbroich, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,018
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004197
Int. Cl.³ F25B 7/00
U.S. Cl. 62—79 22 Claims



1. A method of recovering heat energy which is contained in the vapors of multi-stage evaporators utilized for thermal material-separating processes with an isothermic absorption and including a heat transformer, said method comprising the steps of:

supplying said vapors to at least one expulsion stage and to at least one vaporizing stage of the heat transformer;

vaporizing easily volatized components of a multi-material mixture at a first pressure in said expulsion stage, resulting in a residue or residual mixture of said multi-material mixture;

vaporizing the easily volatized components entering said vaporizing stage in the latter at a second pressure, said second pressure being greater than said first pressure;

supplying heating-steam as process steam to said multi-stage evaporator;

supplying the vaporous, easily volatized components, which are at said higher second pressure, along with said residual mixture resulting from said expulsion stage, to at least one absorption stage of the heat transformer, resulting in the production of heat; and

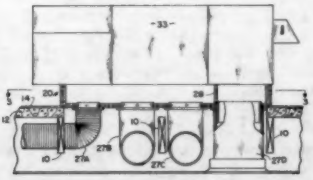
recovering heating-steam by means of said heat producing during said absorption stage.

4,403,481

COMBINATION ROOF MOUNTING CURB AND PLENUM

Robert W. Yoho, Sr., 12900 Automobile Dr., Clearwater, Fla. 33520

Filed Feb. 25, 1981, Ser. No. 237,857
Int. Cl.³ F25D 23/12
U.S. Cl. 62—259.1 4 Claims.



1. A curb to support an air conditioner on the roof of a building and distribute conditioned air, comprising in combination:

four upstanding exterior walls;

the ends of said exterior walls being connected together in the form of a rectangular box;

the bottom edges of said exterior walls being connected together with sheet material whereby an open-top rectangular box is formed;

an upstanding interior wall;

the ends of said interior wall being connected to the insides of different exterior walls whereby a plenum is formed; and

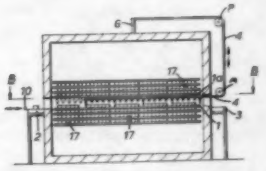
the bottom of said plenum being of sufficient size to accept a plurality of air conditioning supply ducts connected thereto at any desired location therewithin.

4,403,482

AUTOMATIC PLATE FREEZERS

Frank R. Fenner, South Humberside, England, assignor to Jackstone Froster Limited, Grimsby, England

Filed Apr. 29, 1982, Ser. No. 373,274
Claims priority, application United Kingdom, May 1, 1981, 8113571
Int. Cl.³ F25C 5/14
U.S. Cl. 62—341 4 Claims

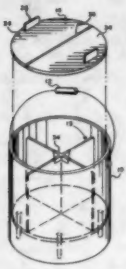


1. In an automatic plate freezer including at least two freezer plates movable between an open condition enabling articles to be frozen to be moved through the space between the plates and a closed condition wherein said articles are engaged by each plate, a receiving station where at least one row of articles can be positioned, one of said plates in its opened condition being disposed in a position to receive articles from said receiving station, and advancing means to advance a row of articles from the receiving station onto said one of said plates, the invention comprising a drive element movable reciprocally in opposite directions parallel to the direction of advance of said articles, driving members spaced along and pivotal relative to said drive element between an article engaging first position and an inoperative second position, means biasing said drive members towards their first position, an operating member coupled to each of said driving members for effecting movement of said driving members between their first and second positions, a positioning element movable between a first position where it engages with the operating member to retain the driving members in their second position during movement of said drive element in a direction away from the direction of advance of said articles and a second position where said positioning member releases said operating member during advance movement of said drive element to effect movement by said biasing means of said driving members to their first position, means cooperating with movement of said drive element to move said positioning element between its first and second positions depending upon whether said drive element is moving away from or towards the direction of advance of said articles, and means operable to withdraw said drive element and said driving members from between the plates when the desired number of rows of articles have been located on the freezer plate by the advancing means to permit the plates to be moved relative to one another to the closed condition.

4,403,483
BUCKET INSERT

Peter E. Lisalda, 14969 Redwood La., Chino, Calif. 91710

Filed Jan. 15, 1982, Ser. No. 339,364
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 7 Claims



1. An apparatus for converting a standard bucket into a bucket advantageously used by fishermen, hunters, picnicers and the like, and having a plurality of separated compartments for storing bait, tackle, food and other items advantageous for fishing, and ice for selected cooling of such items; the apparatus comprising:

a circular, planar base member adapted to substantially conform to the inner dimensions of said bucket and having perforations along at least a 90 degree sector;

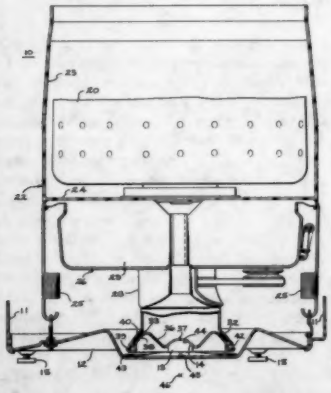
a plurality of divider panels extending perpendicularly from said base member and dividing said base member into isolated perforated and non-perforated sectors; and

a plurality of support legs extending perpendicularly from said base member opposite said divider panels for supporting said base member and divider panels above ice within said bucket.

4,403,484
DUAL NODE SUPPORT ASSEMBLY FOR WASHING MACHINE

Robert M. Fey, and Robert D. Harris, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Sep. 28, 1981, Ser. No. 306,025
Int. Cl.³ D06F 37/24
U.S. Cl. 68—23.3 8 Claims



1. A support assembly for a washing machine having an assemblage of working parts for agitation of fabrics in a liquid for washing the fabrics and centrifugal extraction of liquid from the fabrics, the support assembly comprising:

a mount secured to the assemblage of working parts and adapted to move therewith during operation of the machine;

a cabinet structure enclosing the assemblage of working parts and said mount, said cabinet including a base;

an intermediate member positioned between said mount and said base for movably supporting said mount and the assemblage of moving parts from said base;

said base and said intermediate member being formed with a first set of mating support surfaces for sliding movement therebetween;

said mount and said intermediate member being formed with a second set of mating support surfaces for sliding movement therebetween;

one of said sets of support surfaces being smoothly curved with a relatively short radius of curvature to form a first node for movement of said mount, the other of said sets of support surfaces being smoothly curved with a relatively long radius of curvature to form a second node for movement of said mount;

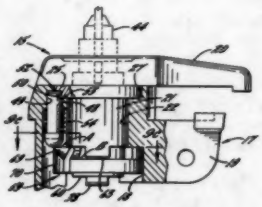
means providing the interface of said one set of support surfaces with a relatively low coefficient of friction and means providing the interface of said other set of support surfaces with a relatively high coefficient of friction so that relative movement between said intermediate member and either of said base and said mount tends to be between said one set of support surfaces;

said intermediate member and the one of said base and said mount forming said one set of support surfaces coming into interfering engagement upon a predetermined amplitude of movement of said mount so that relative movement between said one set of support surfaces is substantially inhibited and relative movement between said other set of support surfaces occurs in response to movement of said mount in excess of the predetermined amplitude.

4,403,485
SLIDE FASTENER BAG LOCK

Frank J. Scherbing, Chicago, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Continuation-in-part of Ser. No. 150,968, May 19, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,856
Int. Cl.³ E05B 17/04, 67/38
U.S. Cl. 70—68 12 Claims



1. A locking device comprising, in combination:

a housing having a tubular opening therein,

an arm means including a cylindrical portion that is telescopically received in the tubular opening of said housing so that the arm means can be rotatably turned between a first angular position and a second angular position,

a key receiving locking mechanism carried by said arm means, including a spindle member that projects within the housing and is rotatable between a key-unlocked and a key-locked position by a proper key inserted in a keyway presented in said arm means,

locking pin means disposed within said housing and adapted

to be movable into restraining engagement with said arm means when said arm means is in the first angular position, said pin being movable away from the arm means to release the arm means for rotation to said second angular position when the lock mechanism is in the key-unlocked position, and

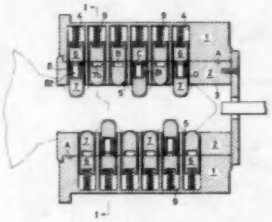
an actuator member adapted to be secured to said lock spindle for rotation therewith, said actuator member having means to move the locking pin into engagement with said arm means when the arm is in the first angular position and the lock spindle is rotated from the key-unlocked to the key-locked position.

4,403,486

PIN TUMBLER LOCK

Mitsunori Miyake, Osaka, Japan, assignor to Kabushiki Kaisha Goal, Osaka, Japan

Filed Dec. 16, 1980, Ser. No. 216,867
Claims priority, application Japan, Dec. 28, 1979, 54-173814
Int. Cl.³ E05B *15/14, 25/00, 27/06, 35/08*
U.S. Cl. 70—383 **9 Claims**



1. In a pin tumbler lock having a housing with a cylindrical bore, a cylinder provided with a key slot rotatable in said bore, at least one housing pocket provided in the cylindrical inner face of the housing, at least one auxiliary pocket in said cylindrical inner face of the housing circumferentially spaced from said housing pocket, at least one cylinder pocket in the cylindrical outer face of the cylinder alignable by rotation of the cylinder with the housing pocket and an auxiliary pocket, a support pin slidably disposed in each housing pocket and each auxiliary pocket resiliently urged by a spring inwardly in the direction of the key slot, one cylinder pin slidably guided in each cylinder pocket and at least one change pin slidably interchangeable between a housing pocket, cylinder pocket and auxiliary pocket, the improvement comprising:

engaging means engageable with the cylinder pin in each position of the change pin in alignment with a cylinder pocket for blocking relative circumferential movement between said change pin and said cylinder pin, and disengaging means for releasing said engaging means from the blocking position when said cylinder pocket is substantially aligned with said auxiliary pocket.

4,403,487

ONE PIECE KEY IDENTIFICATION COVER

Frederic C. Marty, 2919 N. Vincent Ave., Minneapolis, Minn. 55411

Filed Oct. 2, 1981, Ser. No. 308,063
Int. Cl.³ E05B *19/04;* A47G *29/10*
U.S. Cl. 70—408 **10 Claims**

1. A key identification cover including

(a) a hollow body of deformable material having an enlarged portion terminating in

(b) a restricted portion at one end thereof with an opening therein communicating with the interior of the hollow body portion and through which a portion of a key is extendable, said hollow body including

(1) a substantially closed, flat top portion connected to

(2) a substantially closed, flat bottom portion by

(3) opposed spaced sidewalls,

(c) said substantially closed, flat top portion of said hollow body having a slit opening formed therein through which

a key is inserted into the hollow body with a portion of a key extending partially out of said restricted opening portion and the head portion of the key within the hollow body,

(d) the other end of said body portion having means for connecting a holder to the body.

4,403,488

IN-PURSE KEY HOLDER

Angeline V. Engle, and Richard A. Engle, both of 7594 E. 12 Mile Rd., Warren, Mich. 48092

Filed May 14, 1981, Ser. No. 263,707
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—458 **1 Claim**

1. A finder-holder for securing a key ring or the like on a compartment wall of a purse where it is readily accessible, comprising:

an elongated holder body constructed of resilient plastic material, said body having a generally rectangularly outlined bill-like portion extending from the lower ends upwardly about ⅔ the length of the body, including a vertical front wall, an upwardly and rearwardly inclined rear wall, right and left side walls substantially lessor in thickness than the width of front and rear walls, an upwardly and rearwardly slanted substantially flat shoulder portion connecting said walls at their upper ends,

a deep straight mouth-like slit vertically bifurcating said bill-like portion edgewise almost the full length thereof to a point adjacent said shoulder nearer to the forward wall than the rearward wall, thereby separating said bill portion into oppositely disposed resilient blade-like jaws including a forwardly disposed jaw portion and a rearwardly disposed jaw portion adapted to resiliently grip the compartment wall, the thickness of the blades being smallest at their free ends, and tapering gradually thicker toward the shoulder, the rearward blade being substantially larger than the width of the free end where it joins the shoulder, and an elongated, annular, necked-down, generally cylindrical protrusion connected integrally in off-centered relationship to the face of said shoulder, the

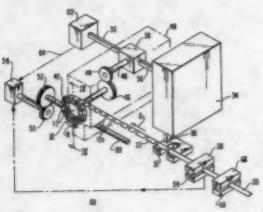
thickness of the protrusion at its juncture with the shoulder being substantially less than the depth of the shoulder, with the protrusion extended oppositely to the slit about ¼ the length of the body with the front wall of said protrusion positioned in line with and substantially flush with the body front wall, the relative size of the shoulder and protrusion being arranged and adapted to leave a generally upwardly slanted ledge portion having a depth of sufficient size to hold a key ring thereon between the partition and the inside wall of the bag without same slipping down the holder body.

4,403,489

STRIP WINDING MACHINE AND METHOD

Ronald S. Munsterman, Shawnee Township, Allen County, and Homer C. Bowers, Lima, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1981, Ser. No. 254,676
Int. Cl.³ H02K *15/04*; B21C *47/00*
U.S. Cl. 72—16 **12 Claims**



1. A winding machine, comprising:
means for punching an impression in band-shaped material;
a rotatable means for winding the punched material;
means for measuring the thickness of said band-shaped material;
means for moving said winding means away from said punching means;
means for adjusting said moving means to move said rotatable winding means in response to said thickness measuring means; and
means for synchronizing said moving means to said punching means.

4,403,490

METAL FORMING LUBRICANT AND METHOD OF USE THEREOF

Donald J. Sargent, West Lafayette, Ind., assignor to E/M Lubricants, Inc., West Lafayette, Ind.

Filed Jun. 24, 1981, Ser. No. 276,937
Int. Cl.³ B21B *45/02*
U.S. Cl. 72—42 **10 Claims**

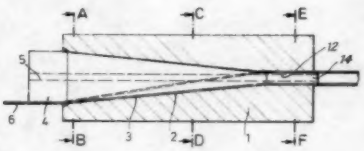
6. In a method of forming two piece cans from black plate steel in which a blank is produced from the black plate steel and the blank is subjected to drawing and ironing operations to produce an elongated can body, the improvement comprising the additional steps of:
a. prior to the drawing operation, coating the portion of the black plate steel which ultimately becomes the exterior of the can body with a first coating lubricant, said first coating lubricant comprising 2.0 to 10.0 percent emulsifiable microcrystalline wax, 3.5 to 11.75 percent refined microcrystalline wax, 0.2 to 1.0 percent unsaturated fatty acid, 0.75 to 3.5 percent nonylphenoxypolyethoxy ethanol, 0.4 to 1.75 percent amines, 24.0 to 32.0 percent of a compound comprising an anion selected from Group VIb of the Periodic Table and a cation selected from Group VIa of the Periodic Table, 8.5 to 11.5 percent synthetic wax emulsion and the remainder distilled water;
b. drying the first coating lubricant;
c. coating the portion of the black plate steel which ultimately becomes the interior of the can body with a second coating lubricant, said second coating lubricant comprising 5.0 to 20.0 percent synthetic wax emulsion and the remainder distilled water; and
d. after the ironing operation, removing said first and second coating lubricants by washing the elongated, enclosed can body in a slightly alkaline solution.

4,403,491

APPARATUS FOR FORMING A SPLIT TUBE

Johannes Wassen, Langenfeld, and Siegfried Honisch, Hellenthal, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,131
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3044003
Int. Cl.³ B21C *1/24*
U.S. Cl. 72—52 **3 Claims**



1. An apparatus for forming a strip into a split tube by progressively drawing and folding said strip comprising:
a die member having a conical bore, with a wide entrance end on one side of the die member, said bore extending and merging with the member in a cylindrical bore at a narrow end of the conical bore said cylindrical bore extending in the member from said narrow end of said conical bore to an exit end on a side opposite said entrance end, said conical bore having a shallow strip forming groove formed in its surface which merges with said cylindrical bore; and
a mandrel of conical configuration matchingly inserted in said conical bore, said mandrel being dimensioned to completely occupy said conical bore except for said groove, so that a strip being drawn through said groove is gradually folded into a split tube as it progresses through said bores and leaves said cylindrical bore of said die member at said exit end on said side opposite said one side.

4,403,492

STRIP COOLING

Thomas Hope, Doncaster, England, assignor to Davy-Loewy, Limited, Sheffield, England

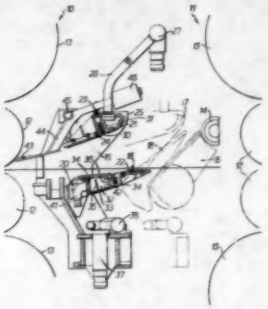
Continuation of Ser. No. 89,499, Oct. 30, 1979, abandoned. This application Dec. 15, 1981, Ser. No. 330,937
Claims priority, application United Kingdom, Nov. 3, 1978, 7843137
Int. Cl.³ B21B *27/06*
U.S. Cl. 72—201 **9 Claims**

1. In combination with a hot metal strip rolling mill stand for rolling a hot strip along a horizontal given path of travel, including means for deflecting said strip after leaving said stand away from said given path of travel, and wherein in its maximum deflected position said deflected strip is a substantial distance away from said given path of travel, a guide means for receiving said hot strip from said stand for delivery therebeyond and wherein said strip is deflected while within said guide means;
said guide means comprising:

a guide plate adapted to guide said strip relative to said stand;

a supporting structure for mounting said guide plate adjacent said stand, and vertically spaced from said given path of travel,

an elongated discharge nozzle having a continuous narrow uninterrupted discharge opening formed in said guide plate operatively carried by said supporting structure, and constructed and arranged to extend substantially across the full width of said strip,



said supporting structure including means which in cooperation with said nozzle delivers a substantially uniform cross sectional coherent and non-turbulent curtain of coolant extending continuously between said nozzle and said strip in a manner that said curtain is maintained throughout said substantial distance irrespective of the degree of deflection of said strip and the distance between said strip and said nozzle, and

means for supplying said coolant to said supporting structure.

4,403,493

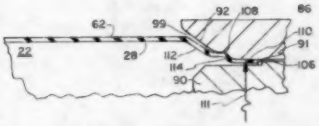
METHOD FOR NECKING THIN WALL METALLIC CONTAINERS

Michael L. Atkinson, Arvada, Colo., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 120,419, Feb. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 51,573, Jun. 25, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 325,693

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—356 **13 Claims**



1. A method of forming at least two reduced diameter portions in a drawn and ironed seamless body having a cylindrically shaped sidewall, an internally formed bottom and an open end, said method comprising deflecting inwardly the open end of the body into contact with first die forming means including a supporting bore with a curvilinear transition portion leading into a necking bore, said supporting bore conforming substantially to the external diameter of the body, said deflecting inwardly causing a reduction in the diameter of the open end on the order of about 3.5 percent to about 3.8 percent over a predetermined length, further deflecting inwardly the reduced open end only over the same predetermined length by a second die forming means to further reduce the diameter of the reduced open end, said second die forming means including a second supporting bore with a second curvilinear transition portion leading into a second necking bore, said second curvilinear transition portion contacting directly and turning the open end of the body along a sloping surface to redeflect the previous diameter formed by the first inward deflection and bringing the previous diameter into conformity with the entire second die forming means, the second deflection reducing the diameter along the predetermined length on the order of between about 1.69 percent to about 1.7 percent, and thereafter deflecting inwardly in a final stage a length less than the predetermined length by a third die forming means comprising a short supporting portion conterminous with a short transition portion leading into a short necking bore, said further reduced open end being brought into comformity with the short supporting portion, transition portion and necking bore to reduce the final diameter thereof on the order of between about 3.8 to about 4.1 percent.

4,403,494

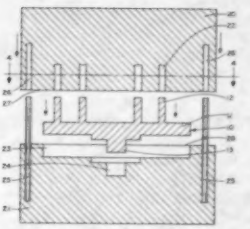
METHOD OF FABRICATING SCROLL MEMBERS BY COINING AND TOOLS THEREFOR

John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 2, 1981, Ser. No. 239,564

Int. Cl.³ B21D *22/00, 31/00, 17/02*

U.S. Cl. 72—360 **3 Claims**



1. A method of fabricating a scroll member, comprising the steps of

(a) providing a preformed scroll member comprising an end plate and an involute wrap which have attained at least about 95 percent of the dimensional accuracy and finish required for the flank surfaces of said wrap and the contacting surface of said end plate; and

(b) coining said preformed scroll member to the required dimensional accuracy and finish.

4,403,495

APPARATUS FOR BENDING CHANNEL SECTION MEMBERS

Terence R. Talbot, Newport, England, assignor to Rockwell International Corporation, Pittsburgh, Pa.

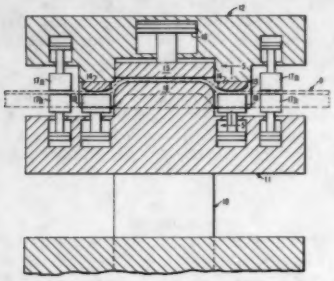
Filed May 15, 1981, Ser. No. 263,817

Int. Cl.³ B21D *7/03*

U.S. Cl. 72—383 **2 Claims**

1. An apparatus for bending an elongate member comprising a pair of spaced parallel planar flanges extending normally from a planar web to form a channel section, said apparatus including a first means for close fitting engagement with the exterior web and flange faces of said elongate member at least in a region of said elongate member in which a bend is to be formed, said first means further having a counter-pressure means, one surface of which engages the exterior face of said web of said elongate member in said bending region, said counter-pressure means capable of being selectively advanced or retracted within said first means; a second means shaped for close fitting engagement with the interior web and flange faces of said elongate member at least in said bending region of said

elongate member, said second means being articulated for movement of projection means on said second means, said movement being relative to said first means to apply a bending force in said bending region acting in the planes of said flanges on longitudinally spaced first and second portions of said elongate member for relative displacement thereof informing at least one bend, said second means and projection means being



maintained in a close fitting engagement with said interior web and flange faces of said elongate member during said displacement, and said first means and said counter-pressure means being maintained in a closely fitting engagement with said corresponding exterior web and flange faces of said elongate member during said displacement, whereby said flanges in said region of said member are maintained in a planar position.

4,403,496

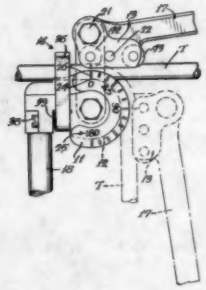
TUBE BENDER CONSTRUCTION

Leonard J. Kowal, Prospect Heights, Ill., assignor to Imperial Clevite Inc., Rolling Meadows, Ill.

Filed Jan. 30, 1981, Ser. No. 229,861

Int. Cl.³ B21D *11/04*

U.S. Cl. 72—388 **28 Claims**



1. In a manually operable tube bender having a mandrel defining a tube-receiving bending groove extending arcuately about a bend axis to define a bending plane, a forming member mounted to said mandrel to swing about said bend axis for urging a tube to be bent into said bending groove, and means for holding the tube against longitudinal displacement in said bending groove during a tube bending operation, the improvement comprising:

a first handle connected to the forming member and having a distal end defining a first gripping portion at said bending plane; and

a second handle having a connecting portion connected to the mandrel and extending therefrom away from the bending plane and defining a second gripping portion connected to the distal end of the connecting portion and extending therefrom toward the bending plane, said second gripping portion being disposed at a distance from said bending axis a distance greater than the spacing of said first gripping portion therefrom, whereby said first gripping portion may be swung about said bending axis to adjacent said second gripping portion free of interference between the user's hands on said gripping portions at said bending plane.

4,403,497

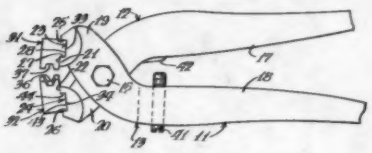
BEAD BENDING TOOL

Felix V. Matteucci, 1422 S. 61st Ave., Cicero, Ill. 60650

Filed May 11, 1981, Ser. No. 262,757

Int. Cl.³ B21D *9/08*

U.S. Cl. 72—409 **17 Claims**



1. A tool for bending articles having a rolled edge or bead comprising:

(a) a pair of levers joined by a pivot pin, the levers being adapted for movement in a pivot plane and defining handles on one side of the pivot pin and arms having forward ends on the other side of the pivot pin, the forward end of each arm defining a slot having a bottom, an inboard surface and an outboard surface such that when the tool is placed in a closed position the two outboard surfaces are substantially parallel;

(b) a male jaw member removably mounted on the forward end of one of the arms and having an arcuate male workface provided with a groove adapted to receive the bead or rolled edge of the article, the male jaw member also being provided with a ledge to be received in the slot and adapted to engage the outboard surface of the slot of the arm the male jaw member is removably mounted on; and

(c) a female jaw member removably mounted on the forward end of the other arm and having an arcuate female workface substantially complementary to the male workface and provided with the groove adapted to receive the bead of the article, the female jaw member being of greater width than the male jaw member, the female jaw member also being provided with a ledge to be received in the slot and to engage the outboard surface of the slot of the arm the female jaw member is removably mounted on;

said jaw members being retained on their respective arms by screws set substantially perpendicular to the slots and extending generally in the direction of the handles.

4,403,498

PRESS

Arthur Holtschmidt, Augsburg, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne Maschinenfabrik und Eisengiesserei GmbH & Co., Gunzburg, Fed. Rep. of Germany

Filed Jul. 14, 1981, Ser. No. 283,297

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027495

Int. Cl.³ B21D *5/02*

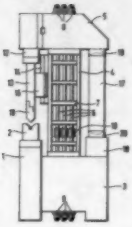
U.S. Cl. 72—455 **5 Claims**

1. A press comprising a tamping tool with hydraulic drive for the tamping tool, a table, and a multiple part structure comprising a lower crosshead arrangement connected to said table, an upper crosshead arrangement spaced above said lower crosshead arrangement, a top clamping bar carried by said upper cross head arrangement, and a center part extending

between and interconnecting said lower crosshead arrangement and said upper crosshead arrangement, said multiple part structure clears a working space in the press that is accessible from three sides, said multiple part structure being stressed during the working operation, and comprising:

(a) said center part comprises upright columns,

(b) said table and said lower crosshead arrangement are formed as a unit of prestressed concrete, and



(c) said multiple part structure has a front side and a rear side with said upright columns spaced between said front and rear sides, and pressure columns including hydraulic expanding cylinders located on the rear side of said upright columns and extending between said lower crosshead arrangement and said upper crosshead arrangement.

4,403,499

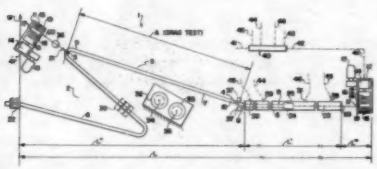
CABLE TESTER ARRANGEMENT AND METHODS

Joel Sack, 45 Beverly Rd., West Orange, N.J. 07052, and Irving Neshin, 737 Suburban Rd., Union, N.J. 07083

Filed Nov. 9, 1981, Ser. No. 319,253

Int. Cl.³ G01N *3/56*

U.S. Cl. 73—7 **13 Claims**



1. Cable tester arrangement for subjecting cable such as mining cable to simulated field conditions substantially corresponding to actual field conditions as normally encountered by the cable for determining cable longevity, comprising

a support surface having a first reference point and a second reference point spaced apart a selective distance and defining a test drag surface area therebetween,

a source means adjacent the second point for feed and return of a selective length of a test span of such a cable having a forward cable end portion and a rearward cable end portion,

first selectively operatable moving means operatively connectable to the cable for moving the forward end portion of the test span of the cable from the second point to the first point, and second selectively operatable moving means operatively connectable to the cable for moving the rearward end portion of the test span of the cable from the second point to the source means, and

control means arranged for selectively independently controlling the operation and movement of the first moving means and second moving means,

for operation in a first test mode for simultaneous reciprocal movement of the first moving means and second moving means to move the test span of the cable relative to the source means and drag the test span back and forth along the drag surface area between the first point and the second point a selective number of times under selective tension to simulate substantially actual field condition dragging as normally encountered by the cable for determining cable dragging longevity, and

alternatively for operation in a second test mode for reciprocal movement of at least one said moving means relative to the other said moving means to permit the forming of a selectively sized loop in an intermediate section of the test span of the cable on the drag surface area between the first point and the second point in a forward releasing feed phase of reciprocal movement of said at least one moving means, and then the removing of the loop in a rearward selective tension pulling return phase of reciprocal movement of said at least one moving means, a selective number of times to simulate substantially actual field condition looping and unlooping as normally encountered by the cable for determining cable looping and unlooping longevity.

4,403,500

APPARATUS FOR MEASURING A PARAMETER RELATING TO AT LEAST ONE SUBSTANCE POSSIBLY PRESENT IN ONE OR SEVERAL CHAMBERS OF A SET OF MEASUREMENT CHAMBERS KEPT UNDER VERY LOW RESIDUAL PRESSURE

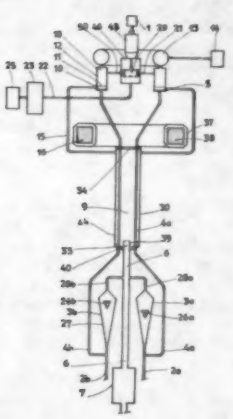
Patrice Le Baud, Versailles, France, assignor to Novatome, Le Plessis Robinson, France

Filed Sep. 15, 1980, Ser. No. 187,452

Claims priority, application France, Oct. 18, 1979, 79 25902

Int. Cl.³ G01N *1/26, 7/10*

U.S. Cl. 73—19 **13 Claims**

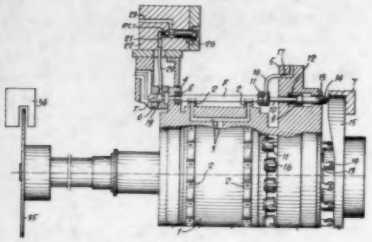


1. Apparatus for measuring a parameter relating to at least one substance possibly present in at least one chamber of a set of measurement chambers kept under ultra-high vacuum by a single vacuum pump installation and each connected by a member (11) allowing limited and selective passage of the substance to be measured at one point of a circuit or of an installation containing a fluid comprising said substance, wherein said measurement chambers are connected to said single vacuum pump installation by low conductance elements offering great resistance to the passage of molecules, and to a means for measuring said parameter, common to said set of chambers, by a selector of the continually rotating type allowing each of said chambers successively and in a short period of time to be placed in communication with said means for measuring said parameter.

4,403,501
METHOD AND DEVICE FOR THE ELECTROPNEUMATIC TESTING OF CIGARETTE FILTERS

Giovanni Pezzi, Bologna, Italy, assignor to Cir S.p.A. Divisione Sasib, Bologna, Italy

Filed Jan. 22, 1981, Ser. No. 228,881
Claims priority, application Italy, Feb. 5, 1980, 12433 A/80
Int. Cl.[3] G01N *15/08*
U.S. Cl. 73—38 14 Claims



1. A method of determining the permeability to the air of filter rods for filter tip cigarettes, comprising the steps of:

applying a fluid under pneumatic pressure to one end of a filter rod, the other end of said filter rod being connected to the atmosphere through a calibrated passage;

converting the pneumatic pressure at said one end of said filter rod to an inspection signal corresponding to the permeability of said filter rod;

generating higher and lower reject threshold signals, the value of said higher reject threshold signal corresponding to a permeability of said filter rod which exceeds an upper permissible limit and the value of said lower reject threshold signal corresponding to a permeability of said filter rod which is less than a lower permissible limit;

generating higher and lower alarm threshold signals having values between those of said higher and lower reject threshold signals;

comparing said inspection signal with said reject and alarm threshold signals;

generating an alarm signal when said inspection signal exceeds said higher alarm threshold signal or is less than said lower alarm threshold signal; and

generating a reject signal when said inspection signal exceeds said higher reject threshold signal or is less than said lower reject threshold signal.

4,403,502
VISCOMETER FOR CAST FOAMING MATERIALS AND ASSOCIATED METHOD

Jan T. Lindt, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

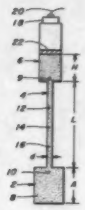
Filed Mar. 4, 1981, Ser. No. 240,581
Int. Cl.[3] G01N *11/08*; G01F *23/28*
U.S. Cl. 73—55 21 Claims

1. A viscometer for foaming materials comprising

reservoir means for containing a supply of material to be foamed,

receiver means for receiving a portion of the foamed material,

pressure sensing means for measuring the pressure of said material as it is foamed, and

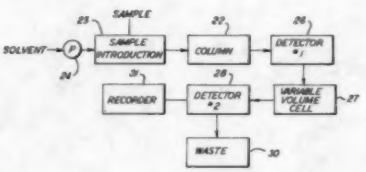


rise measuring means operatively associated with said receiver means for measuring the rate of rise of said foaming material within said receiver means.

4,403,503
APPARATUS AND METHOD FOR THE REDUCTION OF INTERFERENCES IN CHROMATOGRAPHY

Sujit Banerjee, 128 E. Remington Ave., Syracuse, N.Y. 13210, and Edward J. Pack, Jr., Cobblestone Sq., Clay, N.Y. 13041

Filed Nov. 9, 1981, Ser. No. 319,260
Int. Cl.[3] G01N *31/08*
U.S. Cl. 73—61.1 C 12 Claims



1. Apparatus for the reduction of interferences in chromatography comprising in combination a chromatographic column, means for flowing a sample through the column, first and second detectors of substantially identical construction, means for delivering the ouflow from the column to the first and second detectors, variable volume cell means positioned between the column and the second detector so that the column outflow passes through the variable volume cell before entering the second detector, and means for recording the output of the detectors.

4,403,504
ENGINE TESTING MICROWAVE TRANSMISSION DEVICE

Mark K. Krage, Royal Oak, and Alexander Meduvsky, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1981, Ser. No. 292,683
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—116 6 Claims

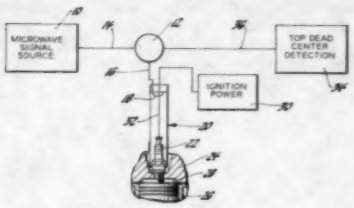
1. Apparatus for transmitting a microwave signal into the combustion chamber of a spark-ignited internal combustion engine and for transmitting a reflected microwave signal therefrom, comprising in combination:

a microwave signal source, a resistor-type spark plug having an internal axially extending resistor and electrodes communicating with the combustion chamber of said engine,

an elongated metallic waveguide having an axially extending part thereof encompassing at least a portion of said spark plug;

an antenna element coupled to said microwave signal source, said antenna element located within said wave-

guide and so positioned relative thereto as to cause the waveguide to be excited in a transverse electric mode with an electric field that is transverse to the longitudinal axis of the spark plug and internal resistor thereof when the antenna element is excited by said microwave signal



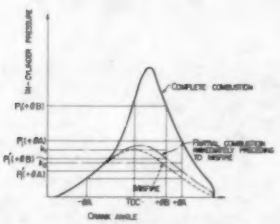
source, said mode having substantially no axially directed electric field whereby the internal resistor of the spark plug does not substantially attenuate the transmission of the microwave signals into and out of the combustion chamber.

4,403,505

IGNITION RANGE DETECTOR FOR INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Anjo, and Tadashi Ozaki, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 2, 1981, Ser. No. 317,405
Claims priority, application Japan, Nov. 7, 1980, 55-156790
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **3 Claims**



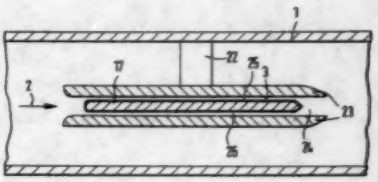
1. An ignition range detecting system for the internal combustion engine, comprising a pressure detector for detecting the pressure in a cylinder of the internal combustion engine, a first circuit connected to said pressure detector for detecting the pressure in the cylinder at a first crank angle of the internal combustion engine preceding to the explosion of the air-fuel mixture in said cylinder, a second circuit for detecting the pressure in the cylinder at a second crank angle of the internal combustion engine after the top dead center where the air-fuel mixture in the cylinder explodes and is combusted, a decision circuit for comparing a predetermined value with the ratio between the pressures detected by said first and second circuits respectively thereby to detect an ignition range, and means for detecting the ignition range always at a predetermined level regardless of the running conditions of the internal combustion engine on the basis of the result of comparison of said pressure ratio with said predetermined value.

4,403,506

APPARATUS FOR THE MEASUREMENT OF THE MASS OF A FLOWING MEDIUM

Heinz Lauterbach, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 96,129, Nov. 20, 1979, Pat. No. 4,317,365. This application Oct. 13, 1981, Ser. No. 310,933
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1979, 2900220
Int. Cl.³ G01F *1/68*; G01P *5/12*
U.S. Cl. 73—204 **2 Claims**



1. Apparatus for the measurement of a flowing medium such as the measurement of induced air mass in internal combustion engines,

an intake manifold having a nozzle body channeling the flowing medium,

flow control means disposed within the nozzle body comprising at least three plate-shaped members with one of the plate-shaped members being positioned intermediate the other two,

said plate-shaped members having plate surfaces in opposed parallel spaced relation to each other defining narrow parallel spaced gaps between the plate members,

said spaced gaps being parallel to the path of the medium flowing through the nozzle body wherein at least a portion of the medium passes through the nozzle with substantially laminar flow,

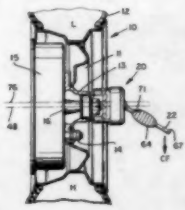
and a hot-film temperature dependent resistor disposed on plate surfaces on either side of each gap in the path of the laminar medium flow.

4,403,507

WHEEL BALANCE INDICATOR

Sam S. Thomas, 3601 Piedmont Rd., Apt. 707, Atlanta, Ga. 30305

Filed Aug. 31, 1981, Ser. No. 297,639
Int. Cl.³ G01M *1/28*
U.S. Cl. 73—457 **6 Claims**



1. A wheel balance indicator for attachment to a wheel assembly while rotatably mounted to a vehicle about a horizontal axis comprising a chuck for connection to the wheel assembly at the axis of rotation of the wheel assembly, an indicator stem having a pivotable ball end portion pivotably received in a socket means of the chuck and a free distal end portion angularly movable with respect to said chuck, means

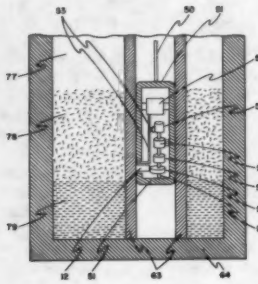
for biasing said pivotable ball end portion in engagement with said socket means to yieldably hold the indicator stem in a fixed attitude with respect to said chuck, whereby when the wheel balance indicator is mounted on a wheel assembly that is out of balance and the wheel assembly is rotated on the vehicle about its axis of rotation so that the wheel assembly oscillates about an axis of oscillation, the indictor stem can be oriented as the wheel assembly rotates so that it extends from its pivotable end portion at the axis of rotation and intersects the axis of oscillation such that the indictor stem becomes balanced in this attitude and remains in this attitude when the rotation and oscillation of the wheel assembly is stopped.

4,403,508

LOCATING INTERFACES IN VERTICALLY-LAYERED MATERIALS AND DETERMINING CONCENTRATIONS IN MIXED MATERIALS UTILIZING ACOUSTIC IMPEDANCE MEASUREMENTS

Gary N. Langlois, Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 10, 1981, Ser. No. 272,227
Int. Cl.³ G01N *29/02*; G01F *23/28*
U.S. Cl. 73—589 **2 Claims**



2. A device for determining the relative acoustic characteristic impedance of a medium, said medium being vertically layered and having a gas/solid interface and including an electrolytic aqueous solution, comprising:

(a) a transmitter having a highly damped pulsed soundwave transducer;

(b) a receiver having a soundwave transducer and an amplifier;

(c) a reference plate having two sides, one of said sides acoustically contacting said transmitter's transducer and said receiver's transducer, and the other of said sides physically contacting said medium, wherein said reference plate is part of a drywell which is vertically disposed within a tank containing said medium, with said transmitter's transducer oriented to transmit a signal pulse to, and said receiver's transducer oriented to receive a return pulse which is the reflection of said signal pulse from, the interface between said other side of said reference plate and said medium;

(d) means for remotely pumping acoustical couplant between the transducers and the reference plate;

(e) means for pressing the transducers against the reference plate;

(f) electronic gating means for passing substantially only said return pulse to said receiver's amplifier;

(g) means for determining the amplitude of said return pulse, said amplitude indicating the relative acoustic characteristic impedance of said medium;

(h) means for vertically displacing said transmitter's transducer and said receiver's transducer;

(i) means for measuring said vertical displacement; and

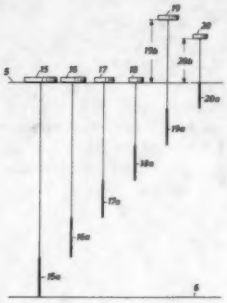
(j) means for determining the discontinuities in the amplitudes for repeated measurements, said discontinuites indicating the vertical heights of the interfaces of said vertical layers.

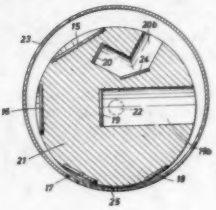
4,403,509

ULTRASONIC EQUIPMENT FOR EXAMINATIONS USING SECTION IMAGES

Carl Kretz, Zipf, Austria, assignor to Kretztechnik Gesellschaft mbH, Zipf, Austria

Filed Jun. 22, 1981, Ser. No. 275,874
Claims priority, application Austria, Jul. 15, 1980, 3663/80
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—639 **8 Claims**





1. In ultrasonic examination equipment comprising

a scanning mechanism including a wheel and drive means for rotating said wheel about its axis,

a plurality of focussing sound transducer heads carried by said wheel and angularly spaced apart with respect to said axis, each of said sound transducer heads being adapted to be activated to emit sound pulses forming a sound beam, which is projected outwardly of the periphery of said wheel and adapted to enter a section surface of an object to be examined, each of said sound transducer heads when activated being also adapted to receive echo pulses originating in said object in response to said sound pulses, and to derive electric echo signals from said echo pulses, each of said sound transducer heads having a working range which has a near end and a far end spaced apart along said beam, each of said sound beams having in said working range of the sound transducer head emitting said beam a higher resolution than in other length portions of said sound beam,

activating means for activating each of said sound transducer heads during the movement thereof through a predetermined angular range with respect to said axis, which angular range is not in excess of the angular spacing of adjacent ones of said sound transducer heads with respect to said axis, whereby successive ones of said sound transducer heads are adapted to successively scan said section surface with said sound beams,

a display unit having a display surface, and

signal-processing means arranged to receive said echo signals from said sound transducer heads and in response to said echo signals to cause said display unit to display said echoes on said display surface at locations geometrically coordinated with their origins in said section surface,

the improvement residing in that

the near ends and far ends, respectively, of angularly adjacent ones of said sound transducer heads are spaced different distances outwardly from the periphery of said wheel,

signal-selecting means are provided, which are arranged to deliver to said signal-processing means only those of said echo signals which have been derived from echoes originated in the working range of an activated sound transducer head, and

pre-entry path defining means are accommodated in said wheel and define at least one pre-entry path which has a substantial length and is arranged to receive within said periphery said sound beam from one of said sound transducer heads which has a working range having near and far ends which are respectively spaced smaller distances outwardly from said periphery than the near and far ends, respectively, of the working range of another of said sound transducer heads, and to project the last-mentioned sound beam outwardly from said periphery when said sound beam has travelled a substantial distance in said pre-entry path.

4,403,510

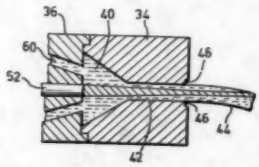
APPARATUS AND METHOD FOR ULTRASONIC INSPECTION

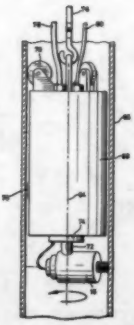
Stewart deWalle, 25 Lagos Rd., Rexdale, Ontario, Canada M9W 4EJ; Dirk W. Hamoen, R.R. #3, Campbellville, Ontario, Canada (L0P 1B0), and James W. Boyd, 36 Belvidere Ave., Hamilton, Ontario, Canada (L9A 3B7)

Filed Oct. 23, 1980, Ser. No. 199,752

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—644 **14 Claims**





1. Apparatus for ultrasonic inspection of an object comprising:

an inspection device having a housing;

the housing having a liquid inlet thereto, a liquid outlet therefrom, and passage means therein connecting the inlet and the outlet and including a convergent portion for the production of a substantially non-turbulent flowing liquid column having an external envelope issuing from the outlet;

an ultrasonic transducer mounted in the housing so as to produce within the flowing liquid column a beam of ultrasonic oscillations having a respective external envelope;

the transducer focusing the said beam at a point downstream from itself, so that the cross sectional area of the beam is less than the cross sectional area of the column generated at said outlet whereby upon inpingement with an object to be inspected the ultrasonic beam envelope is contained wholly within the liquid column and noise caused by turbulence on the surface of the column is inhibited.

4,403,511

HYDRAULIC VIBRATION TESTER

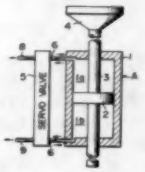
Makoto Shibano, Hatano; Hideaki Kakuma, Atsugi, and Hisatake Yasuyama, Zama, all of Japan, assignors to Kabushiki Kaisha Akashi Seisakusho, Tokyo, Japan

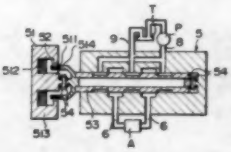
Continuation-in-part of Ser. No. 136,546, Apr. 2, 1980, abandoned. This application Oct. 5, 1981, Ser. No. 308,478

Claims priority, application Japan, Apr. 13, 1979, 54-45616

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—665 **8 Claims**



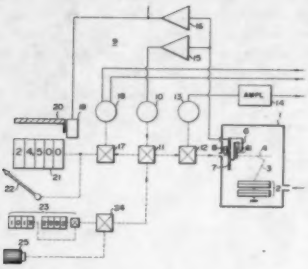


1. Hydraulic vibration tester provided with an actuator comprising a piston fitted in a cylinder and a vibration testing table member connected to the piston through a piston rod and with a direct drive type servo valve enabling an alternative feeding of working pressure fluid alternately to opposite ends of the cylinder of said actuator through passages so as to reciprocate said piston, characterized in that each of the resonance frequency range of said servo valve and the resonance frequency range of said passages is set to be in a high frequency range above 650 Hz so as to achieve a local effective working range in a high frequency range above 650 Hz of said vibration testing table member as said piston is reciprocated.

4,403,512
SERVO-TYPE CAPSULE-EQUIPPED INSTRUMENT

Kazushi Nakahama, Komae, Japan, assignor to Tokyo Aircraft Instrument Co. Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,785
Claims priority, application Japan, Jan. 6, 1981, 56-947
Int. Cl.³ G01L 7/12, 9/00
U.S. Cl. 73—701 11 Claims



1. A servo-type capsule-equipped instrument having an error correcting mechanism, said instrument comprising

at least one capsule,

a sector adapted for rotation corresponding to the displacement of the capsule,

a photosensor for producing an output corresponding to its angular position relative to the sector,

a support for rotating the photosensor, said photosensor being supported adjustably by said support for tracing the sector,

a cam adapted to make the amount of the adjustment of the photosensor variable in accordance with the position of the support,

a motor having a shaft coupled to said support for the displacement thereof,

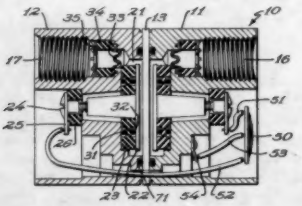
means for generating a signal corresponding to the rotating positional angle of the shaft of said motor, and

an amplifier having its input coupled to said photosensor and its output coupled to said motor, said amplifier amplifying the output of the photosensor and driving the motor so as to maintain the output of the photosensor constant.

4,403,513
CAPACITIVE DIFFERENTIAL PRESSURE TRANSDUCER

John R. Sjolund, St. Paul, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 24, 1979, Ser. No. 5,936
Int. Cl.³ G01L 9/12
U.S. Cl. 73—718 14 Claims



1. A capacitive differential pressure transducer for sensing the difference in pressure between at least two fluids, comprising:

a housing including first and second housing halves;

a diaphragm forming a common capacitive plate to said capacitive differential pressure transducer;

means for securing said first and second housing halves together with said common capacitive plate mounted therebetween and in contact with said housing halves; and,

each housing half including

an interior chamber filled with a force transmitting fluid,

sealing means between said chamber and an input port comprising a diaphragm located in the input port and a retaining ring for holding the diaphragm in said input port, said input port receiving one of said at least two fluids,

sensing capacitive plate means cooperating with said common capacitive plate and including a sensing capacitive plate located within said interior chamber and a first insulative washer mounted between said sensing capacitive plate and an interior wall of said housing half,

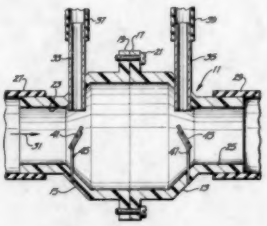
fastening means for holding said sensing capacitive plate means tight against said housing half, said fastening means includes a second insulative washer and a screw extending through said second insulative washer and into said sensing capacitive plate, said second insulative washer being mounted between an oppositely facing interior wall of said housing half and said fastener so that said housing half is pinched between said sensing capacitive plate and said fastener when mounted, and

means connecting said sensing capacitive plate and said common capacitive plate to a sensing circuit, said sensing circuit comprising electronic means having inputs connected to said sensing capacitive plate in the respective housing halves and wherein said sensing circuit has a common junction connected to said housing halves.

4,403,514
PNEUMOTACHOGRAPH WITH PITOT-LIKE TUBES

John J. Osborn, Tiburon, Calif., assignor to Critikon, Inc., Tampa, Fla.

Continuation of Ser. No. 151,742, May 20, 1980, abandoned.
This application Mar. 29, 1982, Ser. No. 363,173
Int. Cl.³ G01F 1/36; A61B 5/08
U.S. Cl. 73—861.52 14 Claims

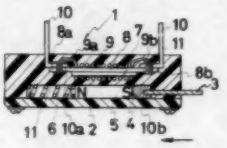


1. A pneumotachograph comprising a housing having a pair of input-output ports defining a flow path for respiratory gases, first and second pitot tubes disposed along said flow path and a pair of baffles disposed in said flow path and below each of said pitot tubes, each of said baffles being disposed at an angle of gas flow reflection between the axis of its associated pitot tube and the flow path from a different one of said ports.

4,403,515
POSITION SENSOR

Shinichiro Iwasaki, Auburn Heights, Mich., assignor to Aisin Seiki Company, Limited, Kariya, Japan

Continuation of Ser. No. 182,662, Aug. 29, 1980, abandoned.
This application Apr. 26, 1982, Ser. No. 371,980
Int. Cl.³ G01L 1/04
U.S. Cl. 73—862.38 10 Claims



1. A position sensor for detecting a displacement of an object, comprising:

a movable member coupled to said object;

permanent magnet means connected to said movable member for producing a magnetic field which varies in a predetermined region in dependence on the displacement of said movable member;

core means made of a magnetically soft material and disposed in said predetermined region for forming a magnetic circuit with said magnet means;

electric coil means including at least one coil wound around said core means for detecting a change in magnetic flux in said magnetically soft member; and

means for detecting the displacement of said object, comprising,

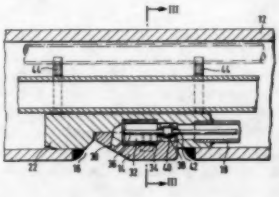
means for applying a pulse voltage to a first terminal of said coil to saturate magnetically said core means, and

means coupled to a second terminal of said coil for producing a displacement output signal indicative of the displacement of said magnet means and therefore of said movable body based on the time between application of said pulse voltage and saturation of said core means.

4,403,516
FURNACE PROBE

Pierre Mailliet, Howald, and Victor Kremer, Luxembourg, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Jan. 18, 1982, Ser. No. 340,362
Claims priority, application Luxembourg, Jan. 23, 1981, 83087
Int. Cl.³ G01N 1/26; G01K 13/12
U.S. Cl. 73—863.11 10 Claims



1. A probe for taking gas samples and thermal measurements in a furnace comprising:

a tubular external casing, said casing having an axis and being provided with a linear array of spacially displaced apertures in the wall thereof;

a plurality of gas sampling conduits disposed within said casing, said sampling conduits being of different length whereby first ends thereof are located adjacent respective of said casing apertures;

block means positioned within said casing and covering each of said casing apertures, said block means being hermetically sealed to the wall of said casing, said block means each further being hermetically affixed to the end of one of said sampling conduits, said block means further including passages for establishing fluid communication between the interior of the conduit affixed thereto and the outwardly facing side of said block means;

conduit support means positioned within casing, said conduit support means extending generally transversely with respect to the axis of said casing, said sampling conduits being located within said casing by said conduit support means;

plate means detachably connected to each of said block means, said plate means being located in said casing apertures and cooperating with said block means to define a gas sampling chamber in communication with an end of a block means passage, said plate means each further being provided with a gas admission orifice which establishes communication between the exterior of said casing and said sampling chamber;

temperature sensor means positioned within at least some of said gas sampling chambers;

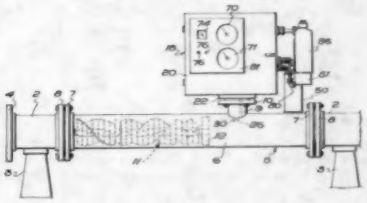
means supporting said temperature sensor means such that movement thereof in a direction parallel to the axis of said casing is prevented; and

means for establishing a flow of coolant in said casing.

4,403,517
LIQUID SAMPLING

Magnus Thomte, Oslo, Norway, assignor to Interpower A/S, Oslo, Norway

Filed Jun. 4, 1981, Ser. No. 270,541
Claims priority, application Norway, Jun. 6, 1980, 801702
Int. Cl.³ G01N 1/14
U.S. Cl. 73—863.84 10 Claims



1. Portable apparatus for sampling viscous oil delivered through a pipe from a supply to at least one receiving container on board a ship, comprising

a portable structure,

a positive displacement pump having an inlet and an outlet,

an inlet duct for communicating the pipe interior with said pump inlet,

a connector for attaching a sample collecting receptacle,

a further duct connecting said pump outlet to said connector,

drive means for said pump, and

control means arranged to operate said drive means and hence said pump, to extract small quantities over the course of delivery and supply them to the collecting receptacle to accumulate therein,

said pump, connector, further duct, drive means and control means being assembled to said structure, whereby the assembly thereof is portable as a self-contained unit for ready connection to and disconnection from the pipe so as to permit ready connection for use with said assembly disposed exteriorly of said pipe, and said inlet duct connecting said pipe interior to said pump inlet, and also to

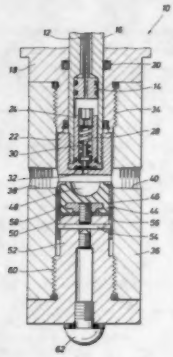
permit disconnection for storage during periods of non-use.

4,403,518

SAMPLER APPARATUS

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Apr. 6, 1981, Ser. No. 251,134
Int. Cl.³ G01N *1/14*
U.S. Cl. 73—864.34 **8 Claims**



1. In a sampler having a resilient cylindrical plug, a shield surrounding said plug and defining an end exposed face of the plug having an indention formed therein and which end exposed face is opposite a cooperative facing plate, and wherein the indention of the exposed face is subjected to contraction in response to movement of a push rod relatively moving said plug towards said facing plate to seal there against and capture a fluid in the indention thereof, the apparatus further including a rigid pump support body, a rigid restraining washer being positioned in contact with said rigid pump support body and forming an aperture, said resilient cylindrical plug being in intimate contact with said restraining washer, a projecting mounting post secured to said rigid pump body and extending through said aperture of said washer and into said plug from an end thereof opposite said indention wherein said mounting post includes an undercut portion with an enlarged overhang shoulder and wherein said shield overhangs the exposed face of said plug and cooperates with said mounting post to hold said plug within said shield.

4,403,519

SAMPLE COLLECTION APPARATUS

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jul. 6, 1981, Ser. No. 280,658
Int. Cl.³ G01N *1/10*; B01F *7/26*
U.S. Cl. 73—864.62 **5 Claims**

1. A sample collecting apparatus for collecting and storing a liquid sample wherein the apparatus comprises:

(a) a cylinder having a head means thereon;

(b) a piston in said cylinder which defines a sample storage chamber adjacent to said piston in said cylinder;

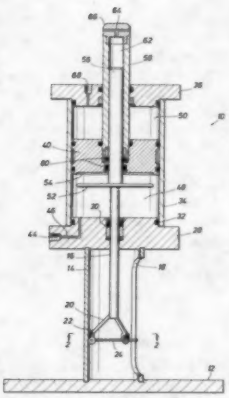
(c) inlet means connected to said sample storage chamber and which is adapted to be connected with a source of a sample to deliver a sample to said chamber;

(d) a stirring plate having a stirring edge in said chamber and which plate is smaller than said chamber to enable said plate to fit within said chamber;

(e) centered rod means having upper and lower rod portions connected to said stirring plate for positioning said plate in said sample storage chamber which plate extends into sample contained in said chamber to agitate said sample around the stirring edge of said plate on reciprocation of said rod means, said rod means having a length sufficient to extend fully through said sample storage chamber to a location remote from said sample storage chamber;

(f) foot powered operator means connected to said rod means for forcing said stirring plate to move through said sample storage chamber; and

(g) said rod means upper portion being larger in diameter than the lower portion thereof with the upper portion thereof being located above said plate and the lower portion being below said plate, and wherein the difference in diameter of said upper and lower portions creates a differential force on admitting a sample to said sample storage chamber under pressure and the differential force urges said plate upwardly in said sample storage chamber toward said piston, and said foot powered operator means forces said plate downwardly overcoming the differential force; wherein said foot powered operator means comprises:



(1) an upstanding support means for said sample collecting apparatus;

(2) treadle stirrup means vertically movably received in said support means adjacent to an opening therein;

(3) connecting means for connecting said stirrup means to said rod means to reciprocate said rod means on movement of said stirrup means;

(4) said opening formed and sized to enable a user to insert his foot in a reciprocating motion;

(5) said stirrup means including a foot receiving plate;

(6) said foot receiving plate and said connecting means being located at the lower end of said lower portion of said rod means;

(7) roller means connected to said foot receiving plate for guiding said foot receiving plate in reciprocating movement; and

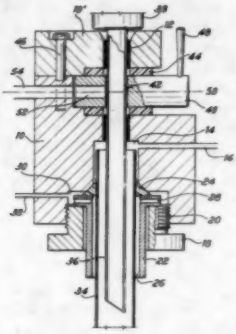
(8) a surface of said support means contacted by said roller means limiting the reciprocating motion of said foot receiving plate to only vertical motion.

4,403,520

CONTROL VALVE FOR A DIRECT ON-COLUMN INJECTOR AND INJECTION METHOD

Giorgio Sisti, Melzo; Bruno Tosi, Carate Brianza, both of Italy; Sorin Trestianu, Brussels, Belgium, and Mario Galli, Legnano, Italy, assignors to Carlo Erba Strumentazione S.p.A., Italy

Filed Dec. 30, 1980, Ser. No. 221,304
Claims priority, application Italy, Jan. 2, 1980, 19005 A/80
Int. Cl.³ G01N *31/04*
U.S. Cl. 73—864.81 11 Claims



1. Apparatus for controlling the injection passage of an on-column injector, said apparatus comprising an injection body, said injection body having an injection passage therethrough for introduction of a sample to a gas chromatography column via an injection syringe inserted through said injection passage; a valve in said injection passage between the outside environment and the end of said injection passage; a second passage fluidically connected to said injection passage at the end of said injection passage; and means for introducing carrier gas into said second passage; wherein said valve includes a valve body with a through-channel, said valve selectively allowing insertion of an injection syringe needle through said through channel of said valve body and said injection passage when said valve is in its open position, wherein said valve also includes at least one second channel fluidically connected to said through-channel at one end and adapted to be connected to a source of carrier gas and/or to the atmosphere on the other end, and wherein said second passage is of a larger cross-sectional area than the cross-sectional area of the annular space created between said injection passage and said injection needle and/or between said through-channel and said injection needle when the injection needle is in its insertion position in said injection passage such that, when the carrier gas is passed through said second channel, the carrier gas introduced through said second channel will create a counter-pressure in said through-channel and said injection passage to avoid sample return through said through-channel and said injection passage without substantial increase in carrier gas flowing into said column.

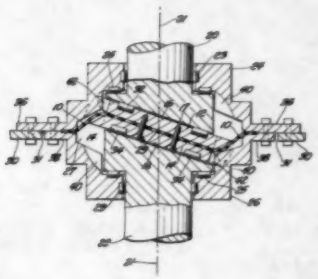
4,403,521

CONTINUOUS SHAFT SEAL

Erwin f'Geppert, Oakland, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 277,457
Int. Cl.³ F16J *15/50*
U.S. Cl. 74—17.8 1 Claim

1. In a system that includes a partition (30) having an opening (31) therethrough: the improvement comprising a first housing structure (24) having a first peripheral flange (36) adapted to overlap and be secured to face areas of the partition that define the aforementioned opening; a second housing structure (26) having a second peripheral flange (38) clamped to the peripheral flange on said first housing structure, said peripheral flange on the second housing structure having a lesser radial dimension than said opening for disposition therein without contacting the partition; a continuous flexible sealing diaphragm 10 located within the space circumscribed by the housing structures, said diaphragm having a peripheral edge area thereof clamped between the housing structure peripheral flanges to seal the defined peripheral joint; a first pressure plate (12) positioned on one face of the diaphragm; a second pressure plate (14) positioned on the other face of the diaphragm; means (17) securing the pressure plates to the diaphragm; a first rotary shaft (20) extending into the first housing structure, said first shaft having an interior end face (16) acutely angled to the shaft axis to form a first cam surface; first anti-friction rollers (32) interposed between said cam surface and the first pressure plate; a second rotary shaft (22) extending into the second housing structure in axial alignment with the first shaft, said second shaft having an interior end face (18) acutely angled to the shaft axis at the same angle as said first mentioned end face, said last-mentioned end face



constituting a second cam surface; second anti-friction rollers (34) interposed between said second cam face and the second pressure plate; thrust bearings (25) in each housing structure for absorbing thrust loads transmitted from one cam surface to the other cam surface through the pressure plates; radial bearings (23) in each housing structure for absorbing radial loads associated with rotational movements of the respective shafts; said diaphragm having a peripheral slack area between the outer edges of the pressure plates and the clamped peripheral edge areas of the diaphragm, whereby the diaphragm-pressure plate assembly can undergo a wobble motion around the intersection point of the diaphragm and the shaft axis; and means for preventing rotational stress on the diaphragm; said stress-prevention means comprising two diammetrically-disposed internal slots (40) in each housing structure, and two diammetrically-disposed projections (42) extending from each pressure plate into different ones of the slots; said housing structures being clamped together to confine the shafts and sealing diaphragm in a unitary assembly installable on the partition by suitable positionment of said first peripheral flange on a face area of the partition.

4,403,522

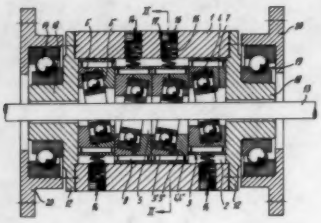
METHOD FOR MAKING A DEVICE FOR CONVERTING A ROTARY MOTION INTO A LINEAR MOTION

Zvonimir Z. Kumpar, Zeist, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Netherlands

Filed Feb. 13, 1981, Ser. No. 235,542
Claims priority, application Netherlands, Feb. 13, 1980, 8000907
Int. Cl.³ F16H *21/16*
U.S. Cl. 74—89 8 Claims

1. A mechanism for converting a rotary motion to a linear motion or vice versa comprising a housing having an axial bore

therethrough, an elongated shaft extending through said bore, a plurality of rolling bearings having inner and outer rings and a plurality of rolling elements between the rings circumscribing said shaft and mounted in side-by-side relation in the bore of the housing, support means for the bearings so that the axis of each bearing is located non-parallel to the axis of said shaft, each said support means comprising a pair of complementary annular members having a central aperture running parallel to the center of said housing bore and axis of the shaft, said pair of members formed with a pocket for the rolling bearing to support the bearing with its axis at an angle to said aperture



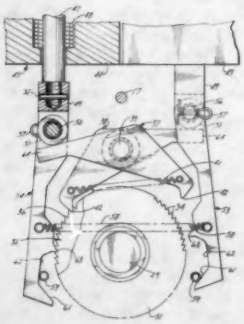
center line and the annular inner surface of the inner ring projects inwardly beyond said aperture surface, which members have been placed resting against one another in the bore of the housing in such fashion that the center lines of the apertures of the members run parallel with the center line of the bore but are displaced transverse to this center line in relation thereto, a cover closing at opposite ends of said bore and pressure elements running through the wall of the housing which elements hold the members in the said position displaced in transversee direction in relation to the center line and means holding the annular members of each pair together to lock the bearing in a fixed angularly disposed position therein.

4,403,523

REVERSIBLE STEPPING ACTUATOR

Fritz O. Seger, Mission Viejo, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 23, 1981, Ser. No. 276,653
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—128 **34 Claims**



1. A reversible stepping actuator for producing a reversible incremental output rotation in response to a pulse input comprising:

a drive gear;

a first ratchet wheel connected to the gear for driving the gear in a first sense of rotation;

a second ratchet wheel connected to the gear for driving the gear in a second sense of rotation opposite to the first sense of rotation;

a first drive pawl for engaging the first ratchet wheel and driving the first wheel in the first sense;

a second drive pawl for engaging the second ratchet wheel and driving the second wheel in the second sense;

a first locking pawl for engaging the first ratchet wheel and preventing rotation of the first wheel in the second sense;

a second locking pawl for engaging the second ratchet wheel and preventing rotation of the second wheel in the first sense;

means for maintaining both locking pawls in engagement with their respective ratchet wheels and both drive pawls out of engagement with their respective ratchet wheels when in a neutral position;

first actuator means for disengaging the second locking pawl from the second ratchet wheel and at about the same time engaging the first drive pawl with the first ratchet wheel; and

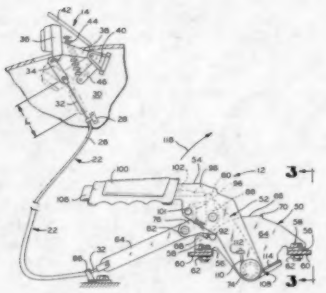
second actuator means for disengaging the first locking pawl from the first ratchet wheel and at about the same time engaging the second drive pawl with the second ratchet wheel.

4,403,524

HEADLAMP DOOR LEVER ASSEMBLY

Anthony R. Gurney, Toledo, Ohio, assignor to Donovan Wire & Iron Co., Toledo, Ohio

Filed Aug. 3, 1981, Ser. No. 289,725
Int. Cl.³ G05G *5/18*
U.S. Cl. 74—538 **7 Claims**



1. A hand-actuated lever assembly for mechanical linkage to and operation of a remote mechanism, said assembly comprising:

a support plate having at least one projection formed along a portion of the periphery of said plate and means for securing said plate from movement;

a lever mechanism including an operating lever and a releasable lock, said operating lever having one end thereof pivotally mounted relative to said support plate and having both a stop means for pivoting said lever and a means for mechanical linkage to such remote mechanism mounted on the opposite distal end whereby such remote mechanism is moved to an operating position when said lever mechanism is pivoted in an operating direction, and said releasable lock including a pawl pivotally mounted to said lever mechanism and adjacent said support plate and means supported by said lever mechanism for biasing said pawl into engagement with said projection of said support plate when said lever mechanism is pivoted in an operating direction whereby said pawl maintains said lever mechanism in the operating position until disengaged;

a handle pivotally mounted relative to said support plate and including a drive member adapted to abut and drive said

stop means of said lever mechanism when said handle is pivoted in an operating direction, thereby simultaneously pivoting said handle and said lever mechanism and engaging said pawl with said projection on said support plate, said handle being returnable to a non-operating position without disengaging said pawl from said projection; and

means on said handle for disengaging said pawl from said projection, thereby releasing said lock and permitting said lever mechanism to return to a non-operating position.

4,403,525

CONNECTING ROD FOR AN ENGINE

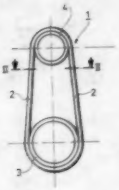
Bernd Bongers, Kirchheim, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow Blohm Gesellschaft mit beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 15, 1980, Ser. No. 216,248

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951112

Int. Cl.³ G05G *1/00*

U.S. Cl. 74—579 E **6 Claims**



1. In a connecting rod for an engine comprising a first annular bearing shell for a crankshaft bearing and a second annular bearing shell for a piston pin, said first and second bearing shells disposed in spaced relation and the axes thereof disposed in laterally spaced parallel relation and said connecting rod having a long axis extending between and transversely of the axes of said first and second bearing shells, said bearing shells each having an annular outer surface with a first portion of each outside surface facing toward other and a second portion of said outside surface facing away from other, a belt strand formed of fiber-reinforced plastics material is wrapped around the second portion of the outside surfaces of said first and second bearing shells and extends between said first and second bearing shells, a bearing plate formed of a fiber-reinforced plastics material extending between said first and second bearing shells and located inwardly of said belt strand, wherein the improvement comprises a plurality of said belt strands wrapped around and extending between said first and second bearing shells, each of said belt strands having a first portion in contact with the second portion of the outside surface of said first bearing shell, a second portion in contact with the second portion of the outside surface of said second bearing shell, and a pair of third portions spaced laterally outwardly from the long axis of said connecting rod and each said third portion extending between one end of said first portion and one end of said second portion of said belt strand which ends are located on the same side of the long axis of said connecting rod, the adjacent surfaces of adjacent said belt strands disposed in spaced relation in the axial direction of said bearing shells, the surfaces of said third portions of said bearing strands facing toward one another and the first portions of the outside surfaces of said shells define a first space, a plurality of said bearing plates located in said first space extending between and in contact with the first portions of the outer surface of said first and second bearing shells and each said bearing plate located between a pair of adjacent said belt strands with the side edges of said bearing plates extending between said bearing shells located between and extending along the outer edges of the third portions of said strands whereby said bearing plates divide the first space into a number of sub-spaces, said bearing plates having a width extending transversely of the long axis of said connecting rod corresponding to the outer dimension between said third portions of said belt strand extending between said bearing shells, thrust pieces located in said subspaces between adjacent said plates and located inwardly of said third portions of said belt strands and disposed in bearing contact with the first portions of the outer surface of said first and second bearing shells, and said bearing plates and thrust pieces are formed of fiber-reinforced plastics material.

4,403,526

MANUAL TRANSMISSION AND HYDRAULICALLY OPERATED SUBTRANSMISSION

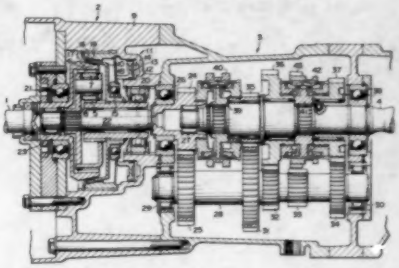
Akio Numazawa, Nagoya, and Hajime Arai, Aichi, both of Japan, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 8, 1980, Ser. No. 166,906

Claims priority, application Japan, Sep. 25, 1979, 54-123503

Int. Cl.³ F16H *37/00, 3/44*

U.S. Cl. 74—740 **4 Claims**



1. A transmission for an automotive vehicle, comprising:

(a) a transmission casing;

(b) a power input shaft;

(c) an auxiliary speed change device, comprising:

(c1) a planetary gear mechanism, comprising a sun gear, a ring gear having hollow hub portion and drivingly coupled to the power input shaft, a plurality of planetary pinions meshed between the sun gear and the ring gear, and a carrier having an internally splined hollow hub portion and rotatably supporting the planetary pinions, said ring gear being rotatably supported at the outside of said hollow hub portion from said transmission casing;

(c2) an annular friction engaging element coupled to the sun gear, which is selectively drivable between a first position wherein it connects the sun gear to the ring gear, and a second position where it connects the sun gear to the transmission casing; and

(c3) a hydraulic actuator, comprising an annular chamber, an annular piston fitted in said annular chamber, and an annular spring plate which engages with and biases said friction engaging element to said second position and which also engages with said annular piston to transmit therethrough driving power of said annular friction engaging element when said hydraulic actuator is energized, a supply of hydraulic fluid pressure to said annular chamber propelling said friction engaging element to said first position against the biasing force of said annular spring plate; and

(d) a main speed change device, comprising:

(d1) a power input member which receives input of rotary power from said planetary carrier, said power input member integrally having a first bearing portion which is rotatably supported from the inside of said hollow hub portion of said ring gear, a splined portion which is engaged with said internally splined hollow hub portion of said planetary carrier, a second bearing portion which rotatably supports said sun gear, a third bearing

portion which is rotatably supported from said transmission casing, and a gear portion, in said order from one end toward the other end thereof in a manner steppedly to increase diameters thereof;

(d2) a power output shaft; and

(d3) a gear transmission mechanism which includes said gear portion of said power input member as a power input gear thereof and provides a plurality of reduction gear ratios between said power input member and said power output shaft, according to manual shift operation.

4,403,527

APPARATUS FOR DECREASING JOLTS DURING GEAR SHIFTS IN AUTOMATIC TRANSMISSIONS IN MOTOR VEHICLES

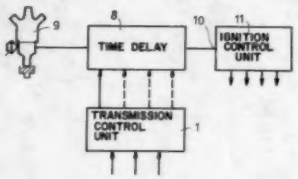
Helmut Mohl, Schwieberdingen; Alfred Müller, Leonberg; Manfred Schwab, Gerlingen, and Walter Stroh, Cleebronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,239

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1979, 2935916

Int. Cl.³ B60K *41/06*

U.S. Cl. 74—851 **10 Claims**



1. In a drive system including a motor having a shaft equipped with associated electrical components for furnishing timing signals during the rotation thereof, a motor control unit operative under control of said timing signals to furnish ignition control signals controlling operating parameters of said motor, and an automatic transmission operative in a plurality of gears, the improvement comprising:

a transmission control unit (1,11,21 . . .) for controlling gear shifts in said automatic transmission, said automatic transmission control unit comprising means for generating a motor instruction signal signifying a desired change of an operating parameter of said motor during one of said gear shifts for decreasing jolts during said gear shifts; and

time delay means (8,20 . . .) connected to said transmission control unit for receiving said motor instruction signals and interposed between said motor control unit and said electrical components associated with said shaft for delaying the furnishing of said ignition control signals in response to said motor instruction signals.

4,403,528

CROWN CAP REMOVING AND RETAINING IMPLEMENT

C. Joseph Locke, Lake Oswego, Oreg., assignor to L-N International, Inc., Lake Oswego, Oreg.

Filed Jun. 29, 1981, Ser. No. 278,042

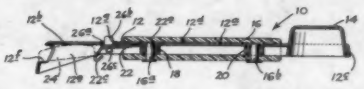
Int. Cl.³ B67B *7/16, 7/44*

U.S. Cl. 81—3.46 R **3 Claims**

1. A crown cap removing and retaining device comprising

a rigid body having an elongate handle portion and a cap-receiving portion joined to one end of said handle portion, said cap-receiving portion having a cavity for receiving a cap and cap-rim-engaging means disposed opposite from said handle portion,

an elongate unitary leaf-spring member cooperating with said cap-receiving portion to releasably hold a removed cap in said cap-receiving portion by engaging the underside of the rim of the cap, said leaf-spring member having an elongate expanse substantially paralleling said handle portion which expanse terminates in one end which is fixed to said handle portion, said leaf-spring member further including a distal end portion joined to the opposite end of said expanse extending at an obtuse angle from said expanse into said cavity for holding engagement with the underside of the rim of a cap disposed in said cap-receiving portion, the extremity of said distal end portion being formed in a reverse bend away from said cavity, said expanse progressing outwardly from said fixed end being



resiliently flexible away from said handle portion and flexing of said expanse producing movement of said distal end portion in an arcuate path extending away from said handle portion and away from said cap-rim-engaging means, movement in said arcuate path producing release of a cap, and

push button means for flexing said expanse,

said body having a transverse bore disposed adjacent where the handle and cap-receiving portions join, said push button means comprising a knob attached to said expanse of said leaf-spring member, said knob extending through said bore and being depressible to flex said expanse away from said handle portion thus to produce movement of said distal end portion in said arcuate path.

4,403,529

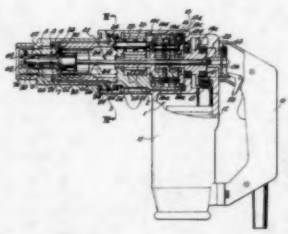
DEVICE FOR FASTENING BOLTS

Seiji Ikeda, Osaka, and Katsuyuki Ono, Moriguchi, both of Japan, assignors to Maeda Metal Industries Ltd., Osaka, Japan

Filed Aug. 19, 1981, Ser. No. 294,234

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—56 **5 Claims**



1. A bolt fastening device comprising an outer socket having a nut engaging bore at its forward end, a tubular holder fitted in the outer socket rotatably independently of rotation of the outer socket, the outer socket and the holder being coupled to a drive assembly for subjecting the socket and the holder to torque acting in directions opposite to each other, an inner socket axially slidably fitted in the holder and rotatable with the holder, the inner socket being formed at its forward end with a bore for engaging therein a tip of a bolt to be sheared therefrom, characterized with a tubular rod inserted in the inner socket and biased by a spring to project into and retract from the tip engaging bore, a stopper retractable into a hole extending through the side wall of the inner socket and pro-

jectable from the hole toward a bearing face positioned outside the inner socket, the stopper being outwardly pushable into engagement with the bearing face when the tubular rod is brought to an advanced position, the stopper being retractable from the bearing face when the tubular rod is in a retracted position, and a knockout pin slidably fitted in the tubular rod.

4,403,530

TORQUE WRENCH

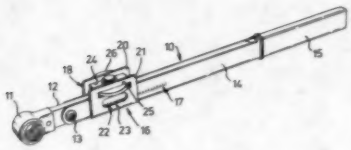
Howard W. Biddle, Cambridge, England, assignor to Cambridge Consultants Limited, Cambridge, England

Filed Jan. 12, 1981, Ser. No. 224,032

Claims priority, application United Kingdom, Jan. 11, 1980, 8001025

Int. Cl.³ B25B *23/142*

U.S. Cl. 81—478 **12 Claims**



1. A torque wrench comprising a driving head, an operating arm and an adjustable torque limit signalling means characterized by: a first arm drivingly connected with the driving head, a second arm pivotally coupled to the driving head, a torque limit signalling assembly slidably adjustable in position along one of the arms for selecting a torque limit, said assembly including a non-linear spring having a spring limit at a single fixed compressional force unique to said spring, said spring being arranged to apply force in reaction to pivoted displacement of said arms with respect to each other at the adjusted position of said assembly and to at least the extent of said fixed force; whereby, upon attainment of said spring limit, namely, a predetermined fixed force regardless of assembly position, the setting of the torque wrench is solely a function of selected positioning of said assembly along said one arm.

4,403,531

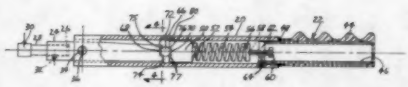
PRESET TORQUE WRENCH

Roy E. Bailey, Rte. #2, Box 100, Clifton, Tenn. 38425, and Ben J. Bailey, 901 Michigan St., Brighton, Mich. 48116

Filed Mar. 11, 1981, Ser. No. 242,626

Int. Cl.³ B25B *23/142*

U.S. Cl. 81—483 **15 Claims**



1. A torque wrench comprising a generally tubular body having a handle at one end and a click arm extending from the other end, the click arm being pivotally attached within the tubular body,

a slot in the end of the click arm inside the tubular body forming a pair of engageable edges parallel to the pivot axis of the click arm,

a slideable member inside the tubular body, a slot in one end thereof forming a second pair of engageable edges parallel to the pivot axis of the click arm and opposed to the click arm,

a free floating circular roller having the axis thereof parallel to the pivot axis of the click arm and having the round side thereof in engagement with each of the aforesaid edges in the unactuated position, said roller spaced from the bottom of each of said slots and separating the click arm from the slideable member,

means within the tubular body engaging the slideable member and urging the slideable member into engagement with the roller, said means including adjustment means to determine the force applied by the slideable member against the roller and click arm.

4,403,532

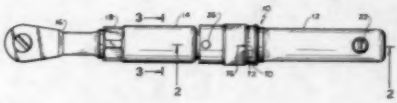
RATCHET NUTRUNNER WITH AUDIBLE TORQUE SIGNAL

William K. Wallace, Barneveld, and David A. Giardino, Deerfield, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,126

Int. Cl.³ B25B *23/142*

U.S. Cl. 81—483 **8 Claims**



1. In a pneumatically powered hand-held tool for setting fasteners, said tool having in axial alignment a handle portion, a motor portion flexibly affixed to the handle portion, and a work engaging portion, an improvement comprising an audible signal means to indicate to the tool operator when preset torque is attained in a fastener setting operation, said signal means including a torque tube enclosed in the handle portion and arranged to conduct pneumatic medium through the handle portion to the motor portion, said torque tube being secured at one end to an extension of the motor housing the other end being unattached and extending axially in the handle portion in spaced relation thereto, and a cam means provided at the free end of the torque tube, said cam means being arranged to cause snap action movement of the handle portion toward contact with the torque tube when a predetermined torque load is applied to a fastener being operated upon.

4,403,533

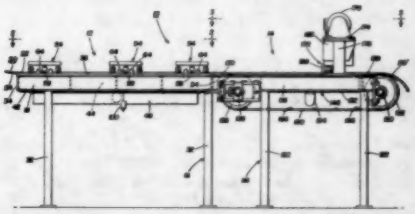
HIGH ACCURACY SLITTER SYSTEM

Ernest R. Cox, Barberton, and Duane E. Snyder, Jr., Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 23, 1981, Ser. No. 286,229

Int. Cl.³ B26D *1/20*

U.S. Cl. 83—56 **17 Claims**



11. In a method for aligning and slitting an elongate web of reinforced elastic material into multiple strips including the steps of:

i. at least partially supporting said web on a cushion of gas acting through a porous supporting and advancing means;

ii. aligning said web;

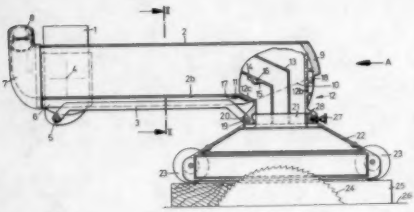
iii. adhering said web to said advancing means; and
iv. slitting said web, wherein the improvement comprises:
(a) aligning said web relative to one of its longitudinal center lines and one of its edges;
(b) keeping said web in a generally flat condition while aligning said web; and
(c) restraining said advancing means against lateral movement at least during said slitting step.

4,403,534

MOVABLE PROTECTIVE HOOD FOR POWER TOOL OF A WORK TOOL MACHINE

Kurt Altendorf, and Siegfried Thiele, both of Minden, Fed. Rep. of Germany, assignors to Wilhelm Altendorf GmbH & Co. KG, Minden, Fed. Rep. of Germany

Filed Sep. 11, 1981, Ser. No. 301,204
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034665
Int. Cl.³ B27G *3/00*
U.S. Cl. 83—100 **12 Claims**



1. A work tool machine comprising:
a power tool;
an exhaust hood assembly disposed over the power tool in a manner to permit access of a work piece thereto;
a stationary member spaced from the hood assembly;
an elongated guide bar extending between the stationary member and the hood assembly;
means for pivotally attaching one end of the guide bar to the stationary member for rotation about a first axis;
means for pivotally attaching the other end of the guide bar to the hood assembly for rotation about a second axis;
an elongated conduit extending between the stationary member and the hood assembly in fluid communication with the hood assembly;
means for pivotally attaching one end of the conduit to the stationary member for rotation about a third axis;
means for pivotally attaching the other end of the conduit to the hood for rotation about a fourth axis, the distance between the first and second axes being equal to the distance between the third and fourth axes, and the distance between the first and third axes being equal to the distance between the second and fourth axes; and
means for exhausting the conduit.

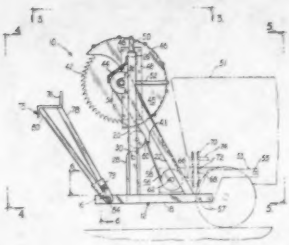
4,403,535

VEHICLE TRANSPORTABLE CORDWOOD CUTTING MACHINE

Frank J. Serwatowski, 12155 Spencer Rd., Milford, Mich. 48042

Continuation-in-part of Ser. No. 39,205, May 15, 1979, abandoned. This application Jan. 2, 1981, Ser. No. 222,157
Int. Cl.³ B27B *5/10*
U.S. Cl. 83—490 **14 Claims**

1. A vehicle transportable cordwood cutting machine attachable to a vehicle so as to be transportable in operable mode, said vehicle having a frame, said machine comprising at least two horizontal frame members, means at one end of each of said two horizontal frame members for cantilevered attachment to said vehicle frame, said horizontal frame members thereby extending outwardly from said vehicle frame, at least two vertical frame members extending upwardly from and joined to said horizontal frame members, each of said vertical frame members at a position spaced from said cantilevered attachment, the height of said vertical frame members above said horizontal frame members being at least twice the elevation of the horizontal frame members above the ground upon which the vehicle is supported, wood cutting means supported on said vertical frame members adjacent the top thereof, means including a power train for powering said wood cutting means,



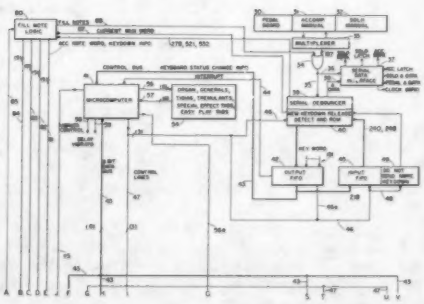
a pair of support members pivotably mounted on one end of said horizontal frame members, a saw table made fast to the upper ends of said pivotable support members constructed to hold a length of cordwood thereon widthwise of said frame members, means yieldably biasing said saw table into an at-rest position disposed away from said wood cutting means, said saw table capable of moving past said wood cutting means when the user pushes against a length of cordwood held on said saw table so as to cut the same into the desired length.

4,403,536

MICROCOMPUTER INTERFACED ELECTRONIC ORGAN

Robert A. Weil, Jr., Dale; Gary A. Eck, Jasper, and Gary R. Fritz, Ferdinand, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 22, 1981, Ser. No. 276,256
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **21 Claims**



1. A microcomputer interfaced electronic musical instrument comprising:
a keyboard having a plurality of keyswitches,
multiplexer means for continuously and cyclically scanning said keyswitches and producing a time division multiplexed data stream comprising a plurality of time slots corresponding to respective ones of said keyswitches and keydown signals in time slots corresponding to actuated said keyswitches,

assignment control means having an input connected to said data stream for monitoring said data stream and producing a multiple bit key actuated word when a keydown signal newly appears in a time slot which previously did not contain a keydown signal and for producing a multiple bit key released word when a keydown signal disappears from a time slot that previously contained a keydown signal, said key actuated and key released words being coded to identify the time slots in which the respective keydown signals newly appear and disappear,

programmable microcomputer means connected to said assignment control means for sequentially accepting and operating on the key actuated and key released words produced by said assignment control means and producing on an output digital tone generator-keyer assignment words containing keydown, key release, and tone frequency and amplitude envelope information, said microcomputer means accepting key actuated and key released words from said assignment control means at a rate slower than the rate at which the keyswitches are scanned by said multiplexer means,

a plurality of tone generator-keyer means each capable of producing and keying a tone having a selectable frequency and an attack and decay amplitude envelope,

register control means interposed between said microcomputer means output and said plurality of tone generator-keyer means for steering the tone generator assignment words to selected tone generator-keyer means in accordance with instructions from said microcomputer means,

said tone generator-keyer means being responsive to said information in the assignment words to produce tones having corresponding frequencies and amplitude envelopes,

said assignment control means including means for comparing the data stream from said multiplexer means with data for each time slot corresponding to whether the last word transmitted to said microcomputer means for that time slot was a key depressed word and for causing a key actuated word to be transmitted to said microcomputer means when a keydown signal appears in the time slot for which the last word transmitted to said microcomputer means was not a key actuated word and for causing a key released word to be transmitted to said microcomputer means when no keydown signal appears in a time slot for which the last word transmitted to said microcomputer means was a key actuated word; and

said microcomputer means including means for transmitting to said assignment control means keyer busy data indicating that no tone generator-keyer means are available for a particular group of keyswitches and said assignment control means includes means responsive to said keyer busy data for inhibiting the transmission to said microcomputer means of a key actuated word for one of that particular group of keyswitches.

4,403,537
BLIND CAPTURE SYSTEM INCLUDING CRESCENDO CONTROL

Gary R. Fritz, Ferdinand, and John W. Robinson, Jasper, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Division of Ser. No. 121,406, Feb. 14, 1980, Pat. No. 4,300,436. This application Aug. 14, 1981, Ser. No. 292,729

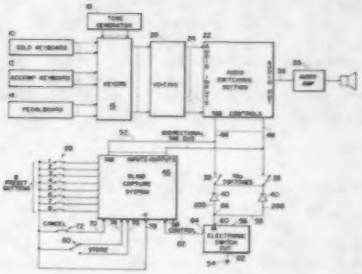
Int. Cl.³ G10B *3/10*

U.S. Cl. 84—345 **7 Claims**

1. In a keyboard musical instrument for producing tones including means for controlling the tones produced by the instrument under the control of a plurality of player operated switches, said means for controlling having a plurality of inputs connectable to said switches, respectively, the improvement being a blind capture system comprising:

a memory in which is stored data representative of a plurality of different combinations of actuated said switches, said data representative of the plurality of different combinations being stored in a plurality of respective storage frames in the memory,

player operated preset select means for selecting ones of said storage frames comprising a manually actuated element capable of movement from one position through a plurality of intermediate positions to a second position, said preset select means cumulatively and successively selecting respective said storage frames one at a time as said element is moved continuously from one position through the intermediate positions to the second position, and



memory output means connected to said memory for addressing the selected storage frames of said memory and reading out the data stored therein and producing a plurality of electrical control signals on corresponding ones of the control inputs so as to cause the means for controlling to be activated in a manner consistent with the combination of control inputs on which electrical control signals are present, said preset select means being operatively connected with said memory output means.

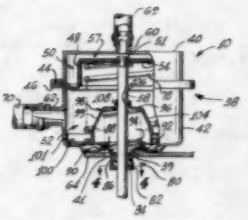
4,403,538
TURBOCHARGER CONTROL ACTUATOR

Leif Rise, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 2, 1980, Ser. No. 182,859

Int. Cl.³ F01B *19/00*

U.S. Cl. 92—94 **5 Claims**



1. A turbocharger control actuator comprising a housing; a diaphragm dividing said housing into a pair of chambers; an actuator rod having one end coupled to said diaphragm for movement therewith and extending therefrom out of said housing through an opening formed in said housing; a relatively stiff spring for predeterminably biasing said diaphragm; a seal member including a lower cylindrical portion concentrically received about said rod and a generally cup-shaped upper portion defining a sealing seat formed generally as a portion of a spherical surface in pivotally bearing engagement with said housing adjacent said opening, said housing including a housing lip formed concentrically about said opening and configured for mating engagement with said sealing seat; retainer means comprising a generally cup-shaped inverted retainer received within said housing about said rod and including a

retainer wall disposed generally between said seal member and said diaphragm and having a passage formed therein for passage of said rod to accommodate limited angular rod displacement, said retainer means further including a generally cylindrical side wall projecting downwardly from said retainer wall for engagement with said housing circumferentially about said housing lip, and a flange projecting radially outwardly from the lower end of said side wall for bearing engagement with said housing, said relatively stiff spring reacting between said diaphragm and said flange for maintaining said flange in bearing engagement with said housing; a relatively flexible spring reacting between said retainer wall and said seal member for urging said sealing seat into pivotally sealing engagement with said housing to maintain said seal member and housing in pivotally sealing relation; and bushing means concentrically secured within said cylindrical portion of said seal member and slidably received about said rod for maintaining said seal member and said rod in axially sliding sealing relation.

4,403,539

ARRANGEMENT FOR CONNECTING A DIAPHRAGM WITH AN ACTUATOR ROD IN A DIAPHRAGM-OPERATED DEVICE

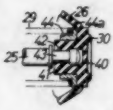
Kenichi Motoki, Hoya, and Nobuyasu Ushiroyama, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,484

Claims priority, application Japan, Nov. 15, 1980, 55-163884[U]

Int. Cl.³ F01B *19/00*

U.S. Cl. 92—94 **2 Claims**



1. An arrangement for connecting a diaphragm and an actuator rod in a diaphragm-operated device comprising a diaphragm formed of elastic material and having a moveable central portion, a connection boss formed at the moveable central portion of said diaphragm and having a blind bore and an annular projection extending radially inwardly from the inner periphery of said blind bore, an actuator rod fitted in said blind bore for elastic engagement therewith having one end portion extending into said blind bore, said one end portion having an annular recess receiving the inwardly extending projection, a retainer fitted over the outer periphery of said connection boss for restraining deformation of said connection boss, said retainer including a cylinder portion fitted over the outer periphery of of the connection boss for restraining radially expansive deformation of the boss and a flange portion integrally extending from the cylinder portion in a radially outward direction with its one side surface abutting against the diaphragm, and spring means for urging said retainer against said diaphragm, the other side surface of said flange portion supporting one end of said spring means.

4,403,540

BACON GRILL

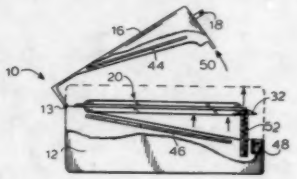
Johannes F. Erkelenz, Seoul, Rep. of Korea, assignor to Top-Qua & Co., Ltd., Victoria, Hong Kong

Filed Apr. 1, 1982, Ser. No. 364,445

Int. Cl.³ A47J *37/10*

U.S. Cl. 99—375 **3 Claims**

1. An electric grill assembly for broiling bacon, which comprises; a housing defining an inner chamber; a lid hinged to the housing and giving access to the chamber; a first heating element positioned in the chamber; a second heating element positioned on the inner surface of the lid and spaced apart from the first heating element; means for energizing the heating elements; means for holding the grill member between the first and second heating elements, in a first horizontal, non-cooking position when the lid is open and in a second, inclined, cooking position when the lid is closed; means in the chamber for moving the grill member from the first to the second position when the lid is closed and for returning the grill member from



the second to the first position when the lid is opened; and a grease collector situated to receive liquid grease from the inclined grill member; said grill member comprising an upper covering plate and a mating lower plate, the lower plate having a corrugated cooling surface; a non-stick coating and spikes to hold the bacon in place; said grill member being removable from its position between the first and second heating elements when the lid is open.

4,403,541

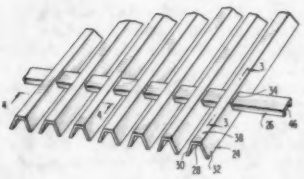
HEAT TRAPPING COOKING GRILL

Bernard B. Berger, Aiken, S.C., assignor to Ducane Heating Corporation, Columbia, S.C.

Continuation of Ser. No. 43,863, May 29, 1979, abandoned. This application Nov. 28, 1980, Ser. No. 210,916

Int. Cl.³ A47J *37/08*

U.S. Cl. 99—385 **14 Claims**



1. A cooking grill for supporting food to be cooked over heating means for providing cooking heat, said cooking grill comprising:

a plurality of elongated channel members spaced transversely apart one adjacent to the other and each comprising a deformable sheet of heat conducting material deformed to provide a transversely and longitudinally extending base and opposing, longitudinally extending sidewalls depending from said base and diverging from each other from said base to the lower edge of each sidewall, said base being substantially flat in both said transverse and said longitudinal directions and defining a wide, substantially flat cooking surface extending transversely across and longitudinally along the upper side of said base, and said base and said opposing sidewalls defining an inverted channel pocket beneath said base, the transverse width of said channel pocket between the lower edges of said opposing sidewalls being significantly greater than the transverse width of said base and said channel pocket providing a trap for a sufficient portion of said cooking heat to cause said wide, substantially flat cooking surface to sear abutting surfaces of food supported over said heating means by said channel member;

at least one set of apertures comprised of an aperture extending through each sidewall adjacent to said substantially flat base of each of said adjacent channel members;

at least one elongated stringer passing through said at least one set of apertures and extending between the opposing sidewalls of each of said adjacent channel members; and,

securing means for securing the base of each of said channel members to said stringer extending between said opposing sidewalls so as to hold said channel members in said transversely spaced adjacent relationship.

4,403,542

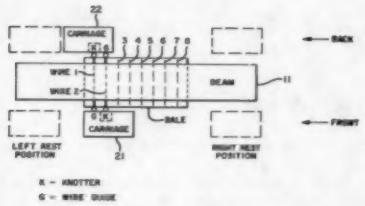
BALE STRAPPING SYSTEM

Charles B. Lewis, West Linn, Oreg., assignor to Cranston Machinery Company, Inc., Oak Grove, Oreg.

Filed Sep. 1, 1981, Ser. No. 298,497

Int. Cl.³ B65B *13/14*

U.S. Cl. 100—2 **13 Claims**



10. The method of strapping a bale of material comprising applying strapping means to opposite sides of the bale, moving said strapping means in one direction along the bale from one strapping station to another, and applying a pair of straps from said opposite sides of the bale in two different positions on the bale at each station.

4,403,543

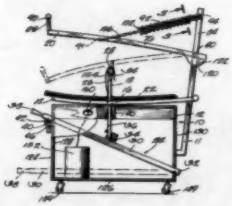
BALING DEVICE

Lovett Sanders, 1216 W. Walnut St., Milwaukee, Wis. 53205

Filed May 3, 1982, Ser. No. 374,354

Int. Cl.³ B65B *13/20*

U.S. Cl. 100—34 **7 Claims**



1. In a scrap baling device comprising a frame, a raise support platform provided with a central opening, a pointed spindle extending through the central opening, means for impaling material on said spindle to assemble a stack, means for binding said stack together to form a bale, and means for removing said spindle from said bale, the improvements wherein said spindle has a shaft and a point including means for receiving tie strings, said shaft is supported from beneath said support platform by a support member normally latched at a raised position, and said means for removing said spindle from said bale comprises means for unlatching said support member and moving it to a lowered position, thereby withdrawing said shaft from said stack.

4,403,544

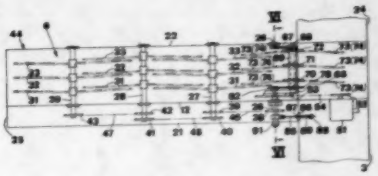
OVERLOAD PROTECTION DEVICE FOR BALER FEEDER MECHANISM

Adrianus Naaktgeboren, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 20, 1981, Ser. No. 294,677

Claims priority, application United Kingdom, Aug. 30, 1980, 8028103

Int. Cl.³ B30B *1/00*

U.S. Cl. 100—189 **7 Claims**

1. In a baler including a bale case, a feed platform adjacent said bale case, feed means for feeding crop material across said feed platform into said bale case including feeder elements connected to and rotatable about a generally stationary means, the improvement comprising resilient means urging said generally stationary means in one direction while permitting movement of said generally stationary means in another direction in response to a predetermined load on said feeder elements.

4,403,545

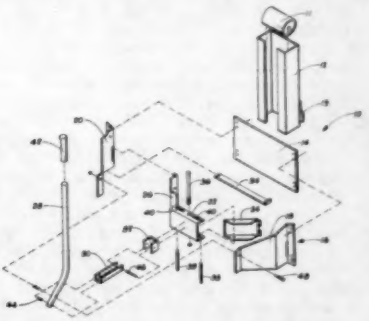
CAN CRUSHING DEVICE

Delmar K. Toburen, Rte. #1, Box 61, Riley, Kans. 67531; Dennis L. Toburen, and Steven R. Toburen, both of 931 Lincoln, Clay Center, Kans. 67432

Filed Jan. 7, 1982, Ser. No. 337,581

Int. Cl.³ B30B *15/30*

U.S. Cl. 100—215 **5 Claims**



1. A can crusher for flatening cylindrical cans, the crusher comprising:

a hopper adapted for receiving a plurality of cans therein, the cans laid on their sides in a horizontal position one on top of the other;

a crusher housing, the hopper attached to and disposed above the housing for feeding the cans individually by gravity into the housing;

a handle pivotally mounted on the housing;

can crushing means adapted for flatening a first can in the housing, the crushing means pivotally attached to the sides of the housing and the handle;

can crimping means mounted on top of the can crushing means adapted for crimping a second can disposed in the bottom of the hopper; and

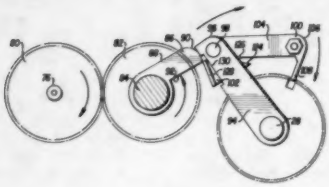
the handle when pivoted on the housing urges the can crimping means and the can crushing means inwardly into the housing, the crimping means engaging the center of the second can and pushing it inwardly as the top and the bottom of the can are folded inwardly toward the center of the can, the can crushing means engaging the folded top and bottom of the first can and flattening the top and bottom of the can against the sides of the can.

4,403,546

PRINTING MECHANISM

Lyell G. Sanford, and Leslie Ransom, both of Cincinnati, Ohio, assignors to General Signal Corporation, Stamford, Conn.

Filed Oct. 20, 1980, Ser. No. 199,910
Int. Cl.³ G06F *11/10*; B41J *3/40*
U.S. Cl. 101—79 **19 Claims**



1. An improved imprinting mechanism, comprising:
a frame;
a first shaft supported in said frame;
a plurality of character wheels mounted for rotation about said first shaft, each wheel comprising a plurality of radially outwardly extending peripheral teeth and plurality of radially outwardly extending characters to be imprinted, said teeth being separated by radially inwardly extending slots;
an arm pivotably mounted on said frame, said arm having a trailing edge;
a rotatable cam means mounted on said frame in position for rotating said arm;
a second shaft affixed to said arm;
an indexing rake pivotably mounted on said second shaft, said rake comprising a plurality of tines, each tine being for insertion into a slot between said teeth of said character wheels, said rake comprising a contact plate pivotable with said rake on said second shaft, said contact plate extending between said cam and said trailing edge, said contact plate being initially spaced from said trailing edge, said cam means initially contacting said plate to pivot said plate and said rake relative to said second shaft and thereby separate said tines from said slots, then pressing said plate against said trailing edge to move said arm and said tines along the circumference of said character wheels, then releasing said plate to insert at least one of said tines into at least one of said other slots and finally releasing said arm to allow said rake to return to its initial position, so that movement of said rake causes at least one of said character wheels to rotate about said first shaft to bring at least one new character into position for imprinting.

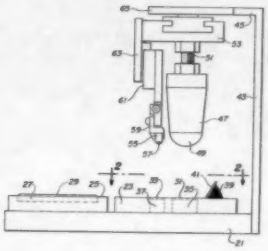
4,403,547

METHOD OF PRINTING INTELLIGIBLE INFORMATION

Steven C. Forberger, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,402
Int. Cl.³ B41M *3/00*
U.S. Cl. 101—170 **10 Claims**

1. A method of printing intelligible information upon a receiving surface comprising
(1) providing a plate having a nonporous plate surface with a shallow depressed area therein, said depressed area having an arbitrary shape that is unrelated to the information to be printed,
(2) filling said depression area with a viscous printing medium,
(3) providing a transfer surface having a geometric pattern conveying intelligible information,
(4) translating said transfer surface in a direction that is substantially normal to said plate surface into contact with



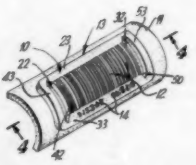
said medium in said filled depressed area, whereby said transfer surface is coated with said printing medium,
(5) removing said coated transfer surface from said filled depressed area, and
(6) translating said coated transfer surface in a direction that is substantially normal to said receiving surface into contact with said receiving surface whereby printing medium in substantially said geometric pattern is transferred from said transfer surface to said receiving surface.

4,403,548

PRINTING PLATE FOR LINEAR BAR SYMBOL CODE

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 112,924, Jan. 17, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,572
Int. Cl.³ B41F *13/00*
U.S. Cl. 101—372 **5 Claims**



1. A printing plate for printing a symbol code on a corrugated paperboard material comprising:
a body portion;
a series of raised, spaced parallel bar members integral with said body portion, said bar members corresponding in size and spacing to the size and spacing of the linear bars of the symbol code and including an approximately centrally located field separation pattern to enable two half-scans of the code; and
a continuous substantially rectangular peripheral frame member integral with said body portion and disposed entirely around said bar members, said frame including opposed pairs of end and side members, said end members of said frame being generally parallel to and spaced away from the longitudinal edges of the first and last bar members in the series, the side members of said frame being unitary with and generally perpendicular to the opposite

end edges of each said bar member, said side members and end members of said frame enclosing a central channel for receiving the bar members, said side members having portions of reduced width adjacent each said end member such that the central channel enclosed by said side members and end members comprises a central, substantially rectangular aperture for receiving the bar members and a pair of end apertures flared outwardly from said rectangular aperture a sufficient amount to enable the symbol code to be scanned by two angled half-scans, with each said half-scan incorporating at least one-half of said symbol code plus the field separation pattern, said frame being raised from the surface of the body portion the same distance as the bar members such that the printing contact surface of said frame member is flush with the printing contact surfaces of the bar members, said frame member constituting the major portion of the printing contact surface of the printing plate.

4,403,549

PRINTING PLATE ATTACHMENT ARRANGEMENT

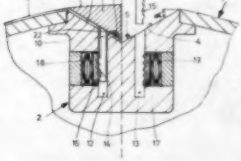
Walter Matuschke, Vevey, Switzerland, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,751

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110982

Int. Cl.³ B41F *27/12*

U.S. Cl. 101—415.1 **2 Claims**



1. Printing plate attachment arrangement particularly for newspaper, magazine, journal and similar printing machines to attach a printing plate (7) to a plate cylinder (1) for printing of subject matter on a web of paper,

in which the cylinder (1) is formed with an axial groove defining two bearing surfaces (3, 4) thereon,

which bearing surfaces (3, 4) meet each other at an obtuse angle to form an obtuse angle of inclination with respect to each other in the shape of a shallow "V" and extend inwardly of a theoretical cylindrical circumference of the plate cylinder,

and comprising

means (5, 6) for retaining the plate (7) in engagement with the bearing surfaces, said bearing surfaces extending at an angle of less than 45° with respect to a tangent of the plate cylinder at the intersection of the bearing surfaces with the cylindrical surface of the plate cylinder,

two cover strips (8, 9) essentially filling the groove and fitting over the plate on the bearing surfaces (3, 4), each cover strip covering one of the bearing surfaces and covering one edge or marginal strip of the plate only, and having a first surface matching the underlying bearing surface and an outer surface corresponding to the theoretical cylindrical circumference of the plate cylinder (1) with the printing plate (7) thereon;

and means (10, 16; 11, 17) for securing the cover strips (8, 9) in the groove;

wherein

the dimension—in circumferential direction with respect to the cylinder—of the bearing surfaces, each corresponds essentially to the width of the margins adjacent the subject matter to be printed;

the outer surfaces (20, 21) of the cover strips (8, 9) have radii of curvature which correspond to the radius of curvature of the printing plate stretched over the plate cylinder to form therewith an essentially continuous cylindrical surface;

and wherein, further, the outer surfaces of the cover strips have a surface characteristic which is hydrophilic and ink-rejecting, said outer surfaces being of steel which is roughened or granulated or knurled to form said hydrophilic and ink-rejecting surface characteristic.

4,403,550

PROCESS FOR PLANOGRAPHIC PRINTING

Thomas K. R. Sharp, Bloomingdale, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 147,045, Aug. 23, 1979, Pat. No. 4,304,601, which is a continuation of Ser. No. 895,628, Apr. 12, 1978, abandoned, which is a continuation of Ser. No. 689,381, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 631,433, Nov. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 583,837, Jun. 4, 1975, abandoned. This application Aug. 7, 198[illegible], Ser. No. 291,182

Int. Cl.³ B41M *1/00*

U.S. Cl. 101—452 **8 Claims**

1. A planographic printing process employing a planographic plate having image and non-image areas comprising applying a planograpic printing ink to said areas to provide for acceptance of the ink by an image area and rejection of the ink by a non-image area, said planographic printing ink being thermally stable at temperatures of about 85° F. to 140° F. and comprising (a) pigment dispersed in a planographic ink vehicle; (b) a modifying varnish in an amount sufficient to provide an ink having a yield value below about 5000 dynes/cm^2 and a viscosity above 100 poise at 40° C. with high internal cohesion, the modifying varnish being selected from the group consisting of cyclised rubber, dimerized rosin esters, alkyds, rosin modified alkyds, esterified rosin modified oleoresinous gells, and hydrocarbon resin solutions; and (c) a silicone polymer, flow control additive in an amount sufficient to increase the temperature, at which the ink becomes pseudoplastic, to at least 85° F. and provide an ink having a low surface energy; said internal cohesion being sufficient to maintain wetting and transference of the ink to the image areas of a printing plate whereas said surface energy is sufficiently low to avoid wetting, by the ink, of the non-image areas of the printing plate within the operating temperatures of the plate.

4,403,551

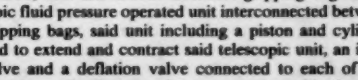
PNEUMATICALLY PROPELLED DUCT MOTOR

John R. Slight, Bromley, England, assignor to Post Office, London, England

Filed Aug. 20, 1980, Ser. No. 179,777

Int. Cl.³ B61B *13/10*; F01B *15/02, 19/04*

U.S. Cl. 104—138 G **4 Claims**



1. Apparatus for self-propulsion along a duct comprising, in combination, first and second inflatable gripping bags and a telescopic fluid pressure operated unit interconnected between said gripping bags, said unit including a piston and cylinder arranged to extend and contract said telescopic unit, an inflation valve and a deflation valve connected to each of said gripping bags, a distribution valve connected to said telescopic unit for controlling the direction of movement of said unit, said distribution valve connected to a source of compressed air,

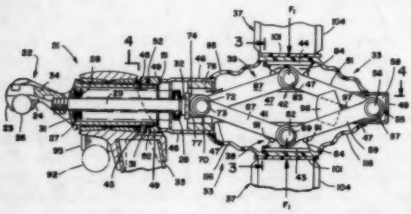
said distribution valve connected to each of said inflation valve of said first and second gripping bags, said first gripping bag extending to grip said duct upon the actuation of said distribution valve and said inflation valve of said first gripper bag contemporaneous with the actuation of the deflation valve of said second gripper bag, said distribution valve connected to said telescopic unit for expanding said unit to move said second gripper bag along said duct, said distribution valve connected to said inflation valve at said second gripper bag for expanding said second gripper bag into engagement with said duct contemporaneous with the actuation of the deflation valve of said first gripper bag, said distribution valve connected to said telescopic member for contracting same and moving said first gripper bag along said duct towards said second gripper bag, said distribution valve having a hollow valve stem associated therewith, said piston having a piston head connected to a hollow piston rod, said hollow valve stem extending through said piston head into said piston rod whereby said compressed air may be fed to said second gripper bag, said distribution valve being located coaxially with and on a side of said first gripper bag remote from said telescopic member.

4,403,552

DETACHABLE GRIP ASSEMBLY AND METHOD

Jan K. Kunczynski, 2400 Arrowhead Dr., Carson City, Nev. 89701

Filed Dec. 9, 1981, Ser. No. 328,932
Int. Cl.³ B61B *12/12*
U.S. Cl. 104—206 **9 Claims**



1. A grip assembly for detachably mounting a chair, gondola or the like to a movable cable for transport thereof, said grip assembly including cable gripping jaw means formed for movement between an open position and a closed position, spring biasing means coupled to said jaw means and formed to generate sufficient gripping force in said jaw means to attach said grip assembly to said cable, and jaw actuating means formed for the application of substantially equal and opposite actuating forces to said grip assembly from opposite sides thereof and from substantially moment-free and lateral thrust-free positions on said grip assembly to urge said jaw means between said open position and said closed position, wherein the improvement in said grip assembly is comprised of:

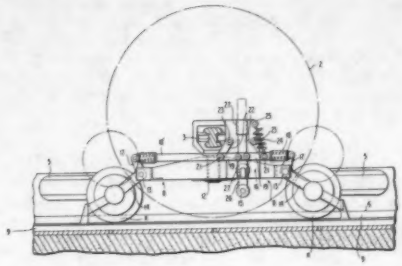
said jaw actuating means being formed as a pair of oppositely facing toggle joint means each having knee portions formed for application of said actuating forces thereto, said toggle joint means being further coupled to said jaw means for transmission of actuating forces sufficient to overcome said gripping force generated by said spring biasing means, said toggle joint means being formed for movement between a stable position on one side of a toggle line to another stable position on an opposite side of said toggle line, and said spring biasing means being formed to maintain said toggle joint means in both of the stable positions.

4,403,553

MOTOR VEHICLE ADAPTED FOR GUIDANCE ALONG A TRACK

Hellmuth Binder, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 16, 1981, Ser. No. 243,772
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009857
Int. Cl.³ B61F *9/00, 13/00*; E01B *25/28*
U.S. Cl. 104—245 **19 Claims**



1. Automobile vehicle usable as a rail-bound conveyance with steerable supporting wheels having a horizontal tread and with at least one transverse guide means arranged between opposite steerable supporting wheels on a track guide lever means which is pivotable in a horizontal plane which guide means acts on the steerable supporting wheels and extends in the operating position below the tread level of the supporting wheels, which transverse guide means, by means of a horizontal swivel axle in the track guide lever means, can be automatically retracted from the operating position into an ineffective waiting position and/or lowered into an operating position by road-way responsible roller feeler means, movably guided at right angles to the driving direction, characterized by the combination of the following features:

(a) an expanding gear system is coupled with the roller feeler, this gear system producing, upon roller feeler movement, a movement oriented in the longitudinal direction of the vehicle, and being movable to and fro between two defined end positions;

(b) a vertically movable section of the track guide lever carrying the transverse guide means is connected, via an angle lever means rigidly connected therewith and via a coupling rod essentially aligned in the longitudinal direction of the vehicle, with the expanding gear system;

(c) the expanding gear system is fashioned to be one of reaction-free or self-locking in the end position corresponding to the operating position of the transverse guide means so that force effects from the roadway side on the track guide lever means lowered into the operating position do not cause any reactions on the position of the expanding gear system;

(d) one of the expanding gear system and the roller feeler means comprising end position securing means for retaining the transverse guide means in the waiting position when not lowered into the operating position.

4,403,554

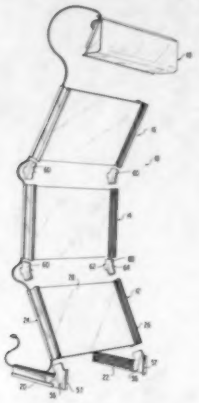
PORTABLE EXHIBIT SYSTEM

Clark Valentine, El Toro, and George E. Bamber, La Crescenta, both of Calif., assignors to Good Thumb Company, Los Angeles, Calif.

Filed Apr. 30, 1981, Ser. No. 259,276
Int. Cl.³ A47B *47/00*
U.S. Cl. 108—23 **17 Claims**

1. A portable exhibit system comprising at least one display

module having a pair of identical mirror image side support extrusions, display means extending between and detachably connected to said side support extrusions, a pair of bottom



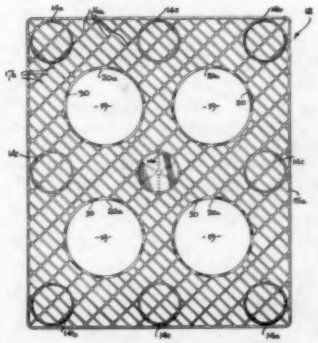
support extrusions having a cross-sectional configuration identical to said side support extrusions and a pair of connector means detachably connecting said side support extrusions to said bottom support extrusions, respectively at an acute angle.

4,403,555

PALLET FOR USE IN HANDLING MATERIAL

John E. Forrest, 1617 - 22nd St., Manhattan Beach, Calif. 90266

Filed Jun. 11, 1981, Ser. No. 272,749
Int. Cl.³ B65D *19/32*
U.S. Cl. 108—51.1 **13 Claims**



1. A pallet for use in the handling and transportation of material comprising

a top half section including an edge border frame and first and second sets of stringers running diagonally between said frame to form a lattice truss structure, the stringers of said first set being substantially parallel to each other, the stringers of said second set being substantially parallel to each other and orthogonal to the stringers of said first set, there being a substantially greater number of stringers in the second set than the first set, and a plurality of spaced apart leg members extending normally from the surface of said lattice structure, and

a base half section having a lattice structure with a frame and first and second sets of diagonal stringers similar to that of said first half section and having a plurality of similar spaced apart leg members extending normally from its lattice structure, and positioned on the associated lattice structure in the same manner as the positioning of the leg members of the first half section on its associated lattice structure, said top and base half sections being joined together to form an integral unit with the ends of corresponding leg members of said sections joined in abutment with each other to form a plurality of leg truss members running between the lattice structure, the second set of stringers of said top half section running orthogonally to the first set of stringers of the base half section and the first set of stringers of the top half section running orthogonally to the second set of stringers of the base half section.

4,403,556

DRUM RETAINER

James J. Van Gompel, Fremont, Ind., assignor to NP Marketing Corporation, Neenah, Wis.

Filed Jun. 4, 1981, Ser. No. 269,409
Int. Cl.³ B65D *19/44*
U.S. Cl. 108—55.3 **13 Claims**

1. In a retainer for a plurality of drums, platform means for supporting drums thereon disposed upright on end, hold-down means extending upright from the platform means, said drums being arranged circumferentially relative to the hold-down means and being engaged at their top by the hold-down means to provide for their securement between the hold-down means and the platform means, a plurality of floor contacting means disposed beneath the platform means to space the platform means above the floor, said floor contacting means having floor piercing means projecting downwardly therefrom to engage and pierce the floor and thereby generally restrain the drum retainer against movement, said hold-down means comprising a plate member adapted to seat on the tops of the drums, a tubular member connected to the platform means at the lower end thereof and having a closed upper end spaced beneath the plate member, a threaded member disposed in the tubular member and extending upwardly through generally aligned openings in the upper end of the tubular member and the plate member, a nut engaged on said threaded member inside said tubular member, said nut being slideable relative to the tubular member and confined against rotation therein, said threaded member being rotatable to drive the nut upwardly against the closed end of the tubular member, and means disposed above the plate member and associated with the threaded member to impose a hold-down pressure on the plate member when the nut is driven tightly against the closed end of the tubular member.

4,403,557

APPARATUS FOR LETTING OUT FURSKINS

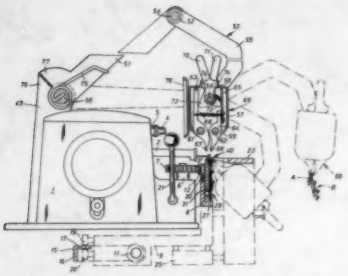
Herbert Dietrich, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,307

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123567

Int. Cl.³ D05B *15/00, 27/00*

U.S. Cl. 112—19 **8 Claims**



1. An apparatus for use with a sewing machine having a reciprocating needle to sew materials such as furskins into sections at a sewing zone, comprising a carriage mounted alongside said sewing machine and being movable through the sewing zone, drive means connected to said carriage for driving said carriage through the sewing zone, a clamp for clamping material therein in a position for being sewn and positioned on said carriage for movement therewith past the sewing zone for the sewing thereof, and a holding bracket for holding an article section which has already been formed in the vicinity of said clamp carried by said carriage for movement with said carriage through said sewing zone.

4,403,558

CONTROL SYSTEM FOR SEWING MACHINE

Charles R. Martell; Elmer N. Leslie; Don D. Isett, all of Dallas, and Stephen S. Treadwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 168,525, Jul. 14, 1980, Pat. No. 4,359,953. This application Nov. 26, 1980, Ser. No. 210,197

Int. Cl.³ D05B *19/00*

U.S. Cl. 112—121.11 **15 Claims**

9. A semi-automatic sewing system, comprising:

a sewing machine;

said sewing machine including a reciprocal needle for stitching a seam in material advanced along a feed direction, and controls for operating said sewing machine;

means for driving said sewing machine;

said driving means including a variable speed motor with a shaft, an electromagnetic brake mounted on the motor shaft, and means for sensing rotation and angular displacement of the motor shaft;

means for counting stitches being sewn by said sewing machine;

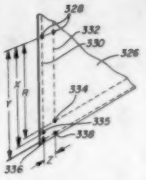
a sensor mounted in spaced relationship ahead of said sewing machine needle for detecting the material edge following a seam;

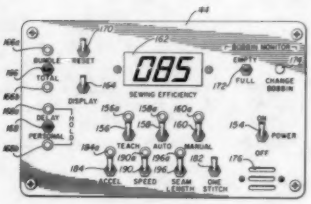
a microprocessor controller operatively associated with said stitch counting means, sewing machine drive means, and sewing machine controls;

said microprocessor controller having plural operational modes and being responsive to said material edge sensor and said motor shaft sensing means;

said microprocessor controller being operable in one mode to record for each seam the operational sequence of said sewing machine controls as a function of stitch count, the sewing speed profile, and an adaptive number of terminal stitches between detection of the material edge by said sensor and the seam endpoint; and

said microprocessor controller in another mode being operable to generate output signals for said sewing machine controls and the brake of said driving means to initiate countdown of said adaptive number of terminal stitches





upon detection of the material edge by said sensor, wherein said microprocessor controller in said another mode monitors the stitches sewn during deceleration of the sewing machine to a seam endpoint and adaptively adjusts the point at which deceleration is initiated in order to minimize the number of slow stitches at the end of each seam.

4,403,559

PROGRAMMING SYSTEM FOR A SEWING MACHINE

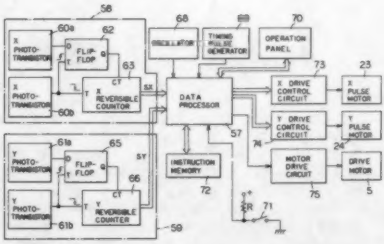
Mitsuhiro Hirose, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 27, 1981, Ser. No. 239,164

Claims priority, application Japan, Mar. 17, 1980, 55-34344

Int. Cl.³ D05B *21/00*

U.S. Cl. 112—121.12 **8 Claims**



1. A programming system for a sewing machine which varies the stitching relative position between a workpiece and a needle according to stitch instructions so as to form a desired seam on the workpiece, said programming system for preparing the stitch instuctions comprising:

a record medium provided with a profile corresponding to said seam;

an index member opposite to said record medium to trace said profile;

a drive mechanism operative to vary the programming relative position between said record medium and said index member;

operating means including a manual member operative to designate one of directions on a fixed plane and to designate the speed of varying said programming relative position in the designated direction, said manual member being capable of inclining toward said fixed plane;

detecting means, associated with said operating means, for detecting the amount of inclination of said manual member and the direction designated by said manual member, and then generating detection signals related to the inclination amount and the designated direction;

data processing means responsive to said detection signals, said data processing means determining tracing speed data corresponding to said inclination amount and position data corresponding to the variation in said programming relative position in said designated direction, and preparing said stitch instructions based on the position data;

instruction storage means for storing said stitch instructions prepared by said data processing means;

means for controlling the operation of said drive mechanism according to said tracing speed data and said position data; and

means for inhibiting the operation of said drive mechanism when said inclination amount is a predetermined value or less.

4,403,560

ELECTRONIC SEWING MACHINE

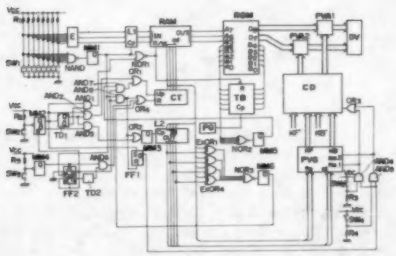
Hachiro Makabe, Kanagawa; Akira Orii, Sagamihara, and Yoshitaka Takahashi, Koganei, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1981, Ser. No. 289,521

Claims priority, application Japan, Aug. 8, 1980, 55-108278

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 E **1 Claim**



1. In an electronic sewing machine having stitch forming instrumentalities including a feed regulating device for feeding a fabric to be sewn and a needle regulating device with a needle vertically reciprocated and laterally swingable transversely of the fabric feeding direction, and an electronic circuit device for controlling the stitch forming instrumentalities for producing and modifying a series of stitch patterns, the electronic circuit device comprising:

first memory means (ROM) for storing stitch control data for producing various stitch patterns;

pattern selecting means (KEY) connected to said first memory means and including a plurality of pattern selecting switches (SW_1) each selectively operated to produce a pattern datum designating a specific one of the stitch control data stored in the first memory means (ROM);

pattern disposing means connected to said pattern selecting means and including a second memory (RAM) for storing a series of pattern data produced by the pattern selecting switches in a predetermined order for sequentially addressing the first memory means to read out therefrom the stitch control data, a function switch (SW_2) operated each time after any of the pattern selecting switches are operated, to thereby produce a signal for causing the second memory to write down therein the pattern data of the pattern selecting switches, a counter (CT) operated upon receipt of the signal from the function switch to count in the second memory in a predetermined order the pattern data produced by the pattern selected switches and to generate count-up signals, and a third memory (L_2) operated upon receipt of the signal from the function switch to store therein the count-up signals of the counter;

pattern variation rate generating means (PVG) connected to said counter and containing a calculating formula and receiving the output of the counter representing the order of patterns and the output of the third memory representing the total number of patterns, to produce an output as a result of calculation with the calculating formula and the outputs of the counter and the third memory;

mode switching means connected to said pattern variation rate generating means and including at least one switch operated to influence the pattern variation rate generating means to determine a variation rate of the selected series of patterns; and

calculating means connected to said first memory means and to said pattern variation rate and operated for receiving the stitch control data produced from the first memory means and the pattern variation rate produced from the pattern variation rate generating means to produce an output signal as a result of calculation with the stitch control data and the pattern variation rate to be applied to a stitch forming device.

4,403,561

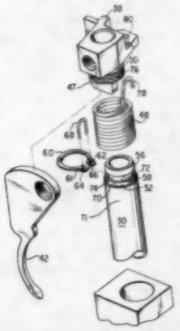
PRESSER BAR SPRING-CONNECTION

Henry Schaeflers, Pittstown, and Jan Szostak, Lincroft, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Nov. 23, 1981, Ser. No. 323,773

Int. Cl.³ D05B *29/02*

U.S. Cl. 112—237 **8 Claims**



1. In combination, two axially aligned members mounted for relative axial movement, at least one of the members including an annular groove, a split resilient ring located in said groove and projecting outwardly from opposite side surfaces of the groove, a helical spring having one end portion threaded into the ring which is constrained thereby to enforce engagement of opposite side surfaces of the ring with the opposite side surfaces of the groove and so prevent relative axial movement of the said one end portion of the spring and the grooved

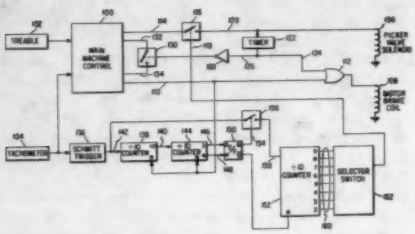
member, and means connecting an opposite end portion of the spring to said other member.

4,403,562

THREAD PICKER CIRCUIT FOR INDUSTRIAL SEWING MACHINE

Tibor L. Tancs, Roselle Park, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 14, 1983, Ser. No. 466,258
Int. Cl.³ D05B *69/22, 65/00*
U.S. Cl. 112—275 **2 Claims**



1. Apparatus for operating a thread picker associated with a thread trimmer in a sewing machine comprising:

operator actuated means for generating a trim command signal to initiate a trim operation of said sewing machine;

control means responsive to said trim command signal for stopping said sewing machine with the sewing machine needle at substantially its lowest position, said sewing machine including a mechanical brake activated in response to a brake signal applied thereto, said control means generating said brake signal to stop said sewing machine, said control means further causing said sewing machine to operate after stopping and generating a trim signal to operate said thread picker;

tachometer means operating in synchronism with said sewing machine for generating a fixed number of pulses for every complete operating cycle of said sewing machine, the frequency of said pulses corresponding to the speed of operation of said sewing machine;

counting means for counting said pulses and providing a count output signal upon reaching a predetermined count value;

means responsive to said brake signal generated by said control means for resetting said counting means;

transmitting means responsive to said count output signal for transmitting said trim signal from said control means to said thread picker;

timer means responsive to operation of said transmitting means for timing a predetermined time interval;

means operative during said predetermined time interval for generating said brake signal; and

means operative during said predetermined time interval for stopping operation of said control means.

4,403,563

ELECTRIC SEWING MACHINE DRIVING APPARATUS

Nozomu Shinozaki, Hirakata; Shigeo Neki, Osaka, and Takashi Dohi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 21, 1981, Ser. No. 287,075
Claims priority, application Japan, Jul. 31, 1980, 55-106099
Int. Cl.³ D05B *69/22*
U.S. Cl. 112—275 **6 Claims**

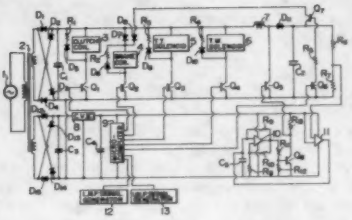
1. An electric sewing machine driving apparatus comprising:

a clutch coil of an electromagnetic clutch for transmitting a torque of a motor to a sewing machine to drive the same;

a brake coil of an electromagnetic brake for applying a braking force to said sewing machine;

means for generating a needle position signal to stop said sewing machine at a predetermined needle position;

a DC power source for energizing said clutch coil and said brake coil;



means for generating a DC voltage higher than a supply voltage of said DC power source; and

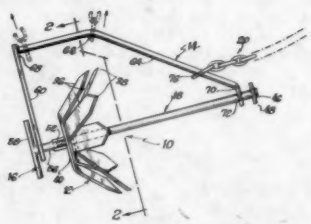
a capacitor disposed to be charged by said voltage generating means; whereby an electric charge stored in said capacitor is caused to discharge through said brake coil to energize the same in response to said needle position signal generated by said needle position signal generating means.

4,403,564

ANCHOR

Robert E. Garvin, 316 Millar Ave., El Cajon, Calif. 92020

Filed Mar. 2, 1981, Ser. No. 239,382
Int. Cl.³ B63B *21/46*
U.S. Cl. 114—299 **1 Claim**



1. An anchor having adjustable flukes comprising an elongated, rod shaped anchor shaft having a threaded portion on the crown end of the shaft, a rectangular plate secured to said shaft at a distance from said threaded portion to receive and retain a plurality of nestable flukes on the crown end portion of said shaft, said flukes being flat metal bars having an orifice in the planar mid-section of each fluke to receive the crown end of said shaft and bent end portions, the innermost fluke having a pair of spaced parallel bar shaped bosses secured to the surface of the mid-section to receive said retainer plate, said bosses abutting the edges of said retainer plate when said flukes are mounted on said shaft to prevent rotation of said innermost fluke and means to secure said flukes to said shaft in various angular relationships from 0° to 90° relative to each other, said securing means comprising a T-shaped handle having an interiorly threaded enlargement at the end of the handle to engage said threaded portion of said shaft and by rotation of said handle to press said enlargement into contact with the outermost fluke to lock said flukes in one of said selected angular relationships between said retainer plate and said enlargement, and means on said shaft for the attachment of an anchor line comprising a bail having one end slidably-mounted on said T-shaped handle and the other end slidably mounted on the end portion of said anchor shaft opposite said crown end,

means on said end portion to prevent said other end of said bail from sliding off said shaft and slidable means on said bail for connection with said anchor line.

4,403,565

EMERGENCY TRIANGULAR ROAD SAFETY DEVICE

Arthur F. Bleiweiss, Toronto, and Terence E. Base, London, both of Canada, assignors to Dominion Auto Accessories Limited, Toronto, Canada

Filed Mar. 11, 1981, Ser. No. 242,625
Int. Cl.³ E01F 9/10
U.S. Cl. 116—63 T 27 Claims

1. An emergency warning device comprising

a base adapted to rest on a road surface,

three arms extending upwardly from the base to define a triangle, the plane of the triangle defining a face generally perpendicular to the road surface and adapted to face the oncoming traffic when the device is on a road surface,

one of said arms extending horizontally on said base and said other two arms extending upwardly,

each arm having passive signal means on at least one surface thereof,

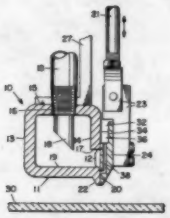
and vane means constructed and arranged, shaped and positioned on said triangle such that wind air flow against the vane means flows upwardly and produces a downward force on the vane means increasing the drag between the base and the road surface tending to prevent movement of the device relative to a road surface.

4,403,566

APPARATUS FOR PRODUCING A PRINTING PLATE

William Bloothoofd, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 161,847, Jun. 23, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 315,092
Int. Cl.³ B05C 5/02
U.S. Cl. 118—407 3 Claims



1. An apparatus to provide a uniform layer of liquid photopolymerizable resin material on a platemaking surface in the manufacture of a printing plate from said resin, said apparatus comprising:

a platemaking surface;

a manifold spanning the width of the platemaking surface vertically nonadjustable with respect to the platemaking surface during movement thereover and moveable along the lengthwise direction of said surface, which manifold is approximately C-shaped in cross-section having a closed bottom side having a wedge shaped lip projecting downward from its forward edge and forming a doctor blade, a back facing side, an upper side, and a forward facing side depending toward but not in contact with the forward edge of said bottom side and defining an opening across the length of said manifold adjacent said bottom side, one of said upper or back facing sides being closed and the other having a plurality of openings for the attachment of resin supply tubes, and closed ends;

a gate being essentially the same length as said manifold, disposed before the opening in the manifold adjacent the bottom side and vertically adjustable so that, when adjusted upward, its lower edge will define with the opening in the manifold an adjustable orifice slot extending the length of the opening in the manifold and when adjusted downwardly completely closing the opening in the manifold;

means to vertically adjust said gate upward and downward;

means to prevent air from entering the apparatus between the gate and the upper section of the forward facing side of the manifold; and

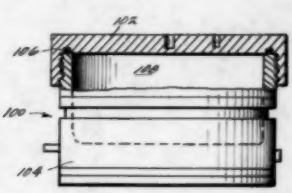
means to supply a regulated flow of liquid photpolymerizable resin material from a pressurized external reservoir through said resin supply tubes attached to said plurality of openings in said manifold.

4,403,567

WORKPIECE HOLDER

Harry daCosta, Paradise Valley, Ariz.; Hugh K. Howerton, Falls Church, Va.; William E. Hughes, Annandale, Va., and Gaines W. Monk, Alexandria, Va., assignors to Commonwealth Scientific Corporation, Alexandria, Va.

Filed Aug. 21, 1980, Ser. No. 179,960
Int. Cl.³ B05C 13/02
U.S. Cl. 118—500 12 Claims



1. A workpiece holder for semiconductor workpieces during treatment comprising:

a casing having an upper exterior surface for receiving and holding a workpiece thereon, an opposed lower surface and a hollow interior having a fixed space; and

a heat absorbing composition chosen from the group consisting of Glauber's salt and calcium chloride hexahydrate sealed within said interior for absorbing heat from said workpiece during treatment.

4,403,568

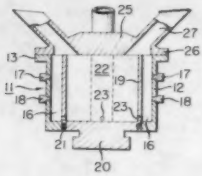
MILK-CLAW INCLUDING INSPECTION MEANS FOR MILK SUCKED FROM COW'S TEATS

Shoetsu Fukuhara; Yoshiaki Nakamura; Tadahiro Ibuki, all of Sayama, and Masaichi Yamamoto, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,774
Claims priority, application Japan, Dec. 24, 1980, 55-183562
Int. Cl.³ A01J 5/04, 7/00
U.S. Cl. 119—14.14 9 Claims

1. A milk-claw provided with inspection means for the milk sucked from cow's teats, comprising: a collecting chamber being formed within an airtight drum housing and connected to inlets for milk formed in the upper wall of said housing and an outlet for milk formed in the lower wall of the housing respectively; inspection chambers for milk which lie adjacent to and partitioned from said collecting chamber for milk by means of a partition wall such that a part of the milk flowing to

the collecting chamber for milk through said inlets is allowed to flow into said inspection chambers; electrode means attached to the wall surfaces of said inspection chambers and functioning to meausre the electric conductivity of the milk



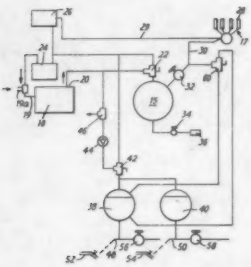
within the inspection chambers for milk; and a small hole provided at the lower part of the partition wall between said collecting chamber and inspection chambers whereby milk within the inspection chambers is allowed to flow in the collecting chamber.

4,403,569

MILKING MACHINE

Arthur J. R. Bennett, 65 Road No. 3, Victory Park, Johannesburg, South Africa

Filed Dec. 29, 1981, Ser. No. 335,372
Int. Cl.³ A01J *5/04*
U.S. Cl. 119—14.18 **6 Claims**



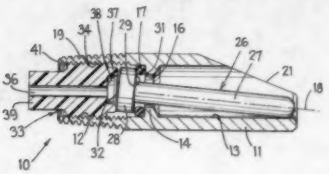
1. A milking machine comprising:
(a) a pneumatic pump having an outlet port and an inlet port;
(b) a teat cluster,
(c) a milk receiver,
(d) a milking line connecting the teat cluster to the milk receiver to convey milk from the teat cluster to the milk receiver,
(e) a suction line leading to the inlet port,
(f) a pressure line leading from the outlet port,
(g) a first valve to which the suction and pressure lines are connected and which is connected to the milk receiver, the first valve being adjustable to connect either the suction line or the pressure line to the milk receiver,
(h) a discharge line leading from the milk receiver and having means whereby it may be connected to a storage vessel,
(i) suction valve means in the suction line movable to an open position in which it connects the suction line to atmosphere,
(j) outlet valve means in the pressure line movable to an open position in which it connects the pressure line to atmosphere, and
(k) control valves in the milking and discharge lines for respectively opening or closing such lines.

4,403,570

ANIMAL WATERER

Donald H. Freehafer, Byron Township, Kent County, Mich., assignor to Cyclone International Incorporated, Holland, Mich.

Filed Jan. 11, 1982, Ser. No. 338,469
Int. Cl.³ A01K *7/00*
U.S. Cl. 119—72.5 **13 Claims**



1. In a nipple-type watering device for animals, including an elongated housing having an elongate passage extending therethrough, said housing having means associated therewith for defining an annular flange in surrounding relationship to said passage, said annular flange defining thereon a rearwardly facing valve seat which is spaced from the opposite ends of said passage, an annular elastomeric seal ring seated on said valve seat, and a valve member tiltable relative to the housing between open and closed positions, said valve member having an elongated stem which projects substantially axially of said passage from a location adjacent the front end thereof inwardly through said seal ring, said valve member also having an enlarged platelike valve head fixed to the inner end of said stem, said valve head having a front face which is normally maintained in sealing engagement with said seal ring to create a first annular band of sealing engagement, said valve member being free of interior flow passages so that opening of said valve member permits flow of water around said valve head and then across said seal ring and thence exteriorly of said stem, comprising the improvement wherein a one-piece cylindrical member of an elastomeric material is sealingly seated within the rearward portion of said passage, said cylindrical member having an annular elastomeric sealing ridge integrally formed thereon and projecting axially forwardly thereof for engagement with a rear face on said valve head to create a second annular band of sealing engagement, said elastomeric ridge also resiliently urging said valve member forwardly to sealingly press said valve head against said seal ring which in turn is sealingly pressed against said valve seat, and said cylindrical member having a small flow orifice extending axially therethrough, said orifice at its forward end opening into a region surrounded by said annular sealing ridge.

4,403,571

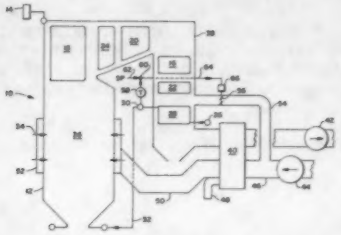
BOILER WITH ECONOMIZER HEAT ABSORPTION REDUCTION

Edward L. Kochey, Jr., Colebrook, Conn., assignor to Combustion Engineering, Inc., Wilson, Conn.

Filed Dec. 9, 1981, Ser. No. 328,893
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—1 A **2 Claims**

1. A steam generator arrangement comprising: a furnace; a gas duct connected to said furnace for carrying flue gas therefrom; steam heating surface located within said gas duct; an economizer heating surface located within said gas duct at a location downstream of said steam heating surface with repsect to gas flow; a forced draft fan; an air duct connected to said forced draft fan and said furnace for conveying air to said furnace; an air heater in heat exchange relationship between gas flowing through said gas duct and air flowing through said air duct at a location in said air duct downstream of said fan and in said gas duct downstream of said economizer; a bypass

duct connected to said air duct between said fan and said air heater and connected to said gas duct at a location upstream of said economizer and downstream of said steam heating surface;



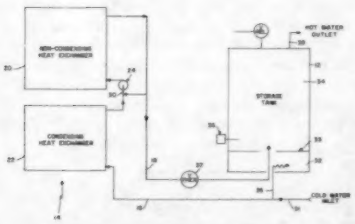
and controllable dampers located within said duct, whereby air is introduced through said bypass directly upstream of said economizer.

4,403,572

COMBUSTION PRODUCT CONDENSING WATER HEATER

Joseph Gerstmann, Framingham, and Andrew D. Vasilakis, Bedford, both of Mass., assignors to Advanced Mechanical Technology, Inc., Newton, Mass.

Filed May 16, 1980, Ser. No. 150,289
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 B **19 Claims**



1. A method of heating water and storing the hot water in an insulated storage vessel comprising:

permitting natural stratification of the water within the vessel such that cooler water collects at the bottom of the vessel;

withdrawing cooler water from the bottom of the vessel and passing that water in heat exchange relationship with combustion gases from a burner assembly to cool those gases below their dew point temperature so as to extract some of the latent heat of vaporization from the gases and to heat the water;

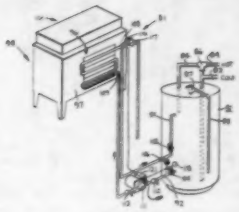
returning the thus heated water to the storage vessel at a location in the storage vessel above the cooler water and in a manner as to avoid mixing with the cooler water, the volume of the cooler water below the location at which hot water is returned to the vessel being sufficiently large to provide for condensation of the combustion gases through substantially the entire heating cycle of the burner.

4,403,573

WATER HEATING APPARATUS FOR SOLID FUEL FIREBOX

Charles J. Cauchy, 935 Lincoln St., Traverse City, Mich. 49684

Filed Mar. 29, 1982, Ser. No. 363,338
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 A **13 Claims**



1. In combination with a solid fuel burning stove, furnace or the like, of the kind having a firebox in which the fuel is burned, which firebox includes a substantially flat exterior wall heated from within by said burning:

a water tank;

first and second water lines connected to said tank and including respective normally open first and second manual valves adjacent said tank;

a normally closed third manual valve connected between said first and second manual valves as a shunt across said first and second water lines;

means including a pump flanked by a pair of normally closed manual drain valves inserted in said second water line and separated from said tank by said second and third manual valves, said first and second water lines having ends remote from said water tank and leading to said firebox;

a heat conductor array comprising a plurality of aluminum fins each having an elongate substantially rectangular plate with one face fixed with respect to said exterior wall of said firebox in close heat exchanging relation, said plates being fixed in close side-by-side, substantially parallel relation to each other;

a single continuous, jointless tube of semi-rigid, heat conductive metal bent in a serpentine shape with elongate substantially parallel legs each fixed to the opposite face of respective said plates on the central length axes of said plates and with smoothly rounded integral bends at the ends of said plates and joining the adjacent ends of said adjacent legs, the opposite ends of said serpentine tube extending in the same direction from the array of plates substantially in parallel with each other, one said tube end being connected by a fitting to said second waterline remote end, the other tube end being connected by a fitting to the first waterline remote end and through a first temperature sensor to a temperature-pressure relief valve openable to a drain outlet;

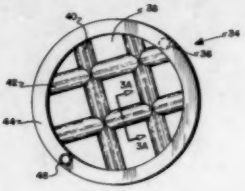
a second temperature sensor associated with said tank for sensing the temperature of water therein, said pump having a controller responsive to a preselected temperature drop between said temperatures sensed by said first and second temperature sensors, respectively, for operating said pump to circulate water from said tank through said serpentine tube and back through said tank, such that said firebox heats water in said tank.

4,403,574

BOILER PANCAKE DESIGN

Stephen Free, 47584 Bursley Rd., Wellington, Ohio 44090

Filed Jun. 10, 1981, Ser. No. 272,673
Int. Cl.³ F22B 5/00
U.S. Cl. 122—353 2 Claims



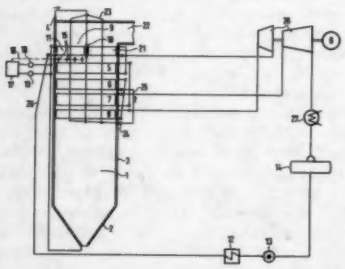
1. A direct fired boiler device comprising:
a firebox in which coal, wood or other suitable fuel is burned to produce combustion products;
a series of two or more heat transfer devices maintained above said firebox, each said heat transfer devices comprising interconnected grid patterns of hollow elliptical-shaped conduits with their respective major axes parallel to the flow path of said combustion produts, said grid pattern being asymmetrical; and
a chimney in communication with said firebox to convey said combustion products from the boiler.

4,403,575

DEVICE FOR PREVENTING FLASHING TO STEAM IN AN ECONOMIZER OF A FLOW THROUGH STEAM GENERATOR

Rudolf Kral, Langensendelbach, and Reiner Engelhardt, Effeltrich, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,884
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032507; Jul. 3, 1981, 3126321
Int. Cl.³ F22D 5/26
U.S. Cl. 122—451.1 4 Claims



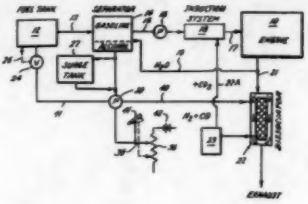
1. Device for preventing flashing to steam in an economizer of a flow-through steam generator wherein the economizer has heating surfaces disposed downstream of an evaporator and superheater surfaces in direction of a flue-gas path, comprising at least one partition separating the cross section of the flue-gas path in vicinity of the economizer into at least two joint areas separated from one another, the economizer having tubes disposed only in one of the thus formed joint areas, and further comprising shut-off devices for the flue gas disposed upstream of said tubes of the economizer as viewed in the direction of the flue-gas path and control means for said shut-off devices depending upon pressure and temperature of water in the tubes of the economizer, said shut-off devices being closable by said control means if danger of flashing to steam exists in the economizer.

4,403,576

FUEL SYSTEM FOR AND A METHOD OF OPERATING A SPARK-IGNITED INTERNAL COMBUSTION ENGINE

Edward Dimitroff, and John A. Vitkovits, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 784,414, Apr. 4, 1977, Pat. No. 4,210,103.
This application Apr. 15, 1980, Ser. No. 140,477
Int. Cl.³ F02B 47/04
U.S. Cl. 123—3 48 Claims



1. In a method of operating a spark-ignited internal combustion engine having an induction system in which gasoline may be atomized, the steps of storing a blend of gasoline and a liquid hydrocarbon alcohol of from 1 to 3 carbon atoms in a fuel tank, receiving the blend from the fuel tank into a separator tank in which the blend is separated into gasoline and liquid alcohol, supplying separated gasoline from the separator tank to the induction system through a first conduit means in order to atomize the gasoline, supplying separated liquid alcohol from the separator tank through a second conduit means separate from the first conduit to a means in which the liquid alcohol is dissociated into vapors including hydrogen, carbon monoxide and carbon dioxide, supplying the vapors to the induction system for mixing with the atomized gasoline to provide a fuel for the engine, and regulating the amount of vapors mixed with the atomized gasoline by supplying less dissociated vapors to the engine as the mass ratio of air to gasoline in the induction system increases and discontinuing the supply of vapors when the air to gasoline mass ratio becomes greater than 13 to 1.

4,403,577

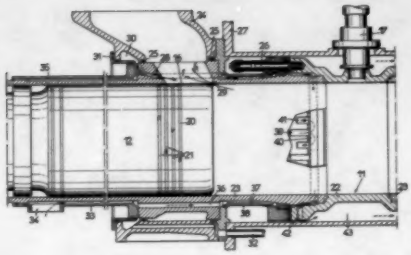
FREE PISTON INTERNAL COMBUSTION ENGINES

Henry Benaroya, 41, Boulevard du Commandant Charcot, Neuilly-sur-Seine, France

Filed Dec. 18, 1980, Ser. No. 217,993
Claims priority, application France, Jun. 20, 1979, 79 15837
Int. Cl.³ F02B 71/00
U.S. Cl. 123—46 R 7 Claims

1. In a free piston internal combustion engine, a motor cylinder having a wall formed with axially spaced intake and exhaust ports,
at least one driving piston located in said cylinder for reciprocating movement and drivably connected to a compressor piston located in a compression cylinder,
a head ring carried by said driving piston and cooperating with at least said exhaust ports to progressively uncover said exhaust ports during each power stroke of said driving piston;
and air delivery means, separate from said intake ports, formed in said cylinder adjacent said exhaust ports and spaced from said intake ports for supplying air originating from said compression cylinder toward the motor cylin-

der as a jet directed along those portions of said driving piston and at said head ring which cooperate with said



exhaust ports during the moment when said driving piston initially clears the exhaust ports.

4,403,578

SEPARATE LUBRICATING SYSTEM FOR OUTBOARD ENGINE

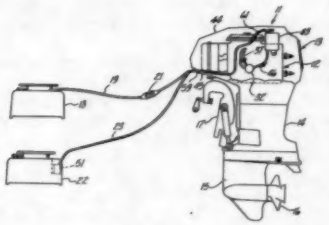
Tomio Iwai, and Motoi Tobinaga, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata and Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, both of, Japan

Filed Nov. 2, 1981, Ser. No. 317,347

Claims priority, application Japan, Nov. 27, 1980, 55-167823

Int. Cl.³ F01M *1/00, 1/02, 3/02*

U.S. Cl. 123—73 AD **24 Claims**



1. In a lubricating system for a two cycle engine comprising a lubricant delivery system for delivering lubricant to the engine, a relatively small delivery tank for supplying lubricant therefrom to said lubricant delivery system, and a separate, larger capacity lubricant storage tank, the improvement comprising pumping means located in said storage tank for pumping lubricant from said storage tank into said delivery tank.

4,403,579

INTERNAL COMBUSTION ENGINE IGNITION DISTRIBUTOR DRIVE ARRANGEMENT

Robert E. Young, and Bobbie D. Bridgewater, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1981, Ser. No. 295,557

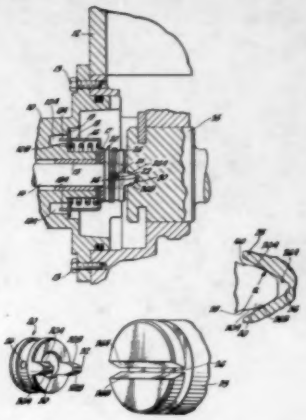
Int. Cl.³ F02P *7/00*

U.S. Cl. 123—146.5 A **3 Claims**

1. An internal combustion engine ignition distributor drive arrangement through which the distributor shaft is driven by and in an end-to-end relationship with the engine camshaft when the distributor is assembled on the engine comprising:

means drivably engaging said distributor shaft having at least one projection that extends in the direction of the longitudinal axis of said shaft and has two opposed face surfaces that extend axially of the shaft and are substantially equally curved toward each other from the root to the tip thereof;

a projection accommodating notch in the end of said camshaft adjacent said distributor shaft having substantially plane sidewalls that taper substantially equally inwardly at



such an angle that each may tangentially engage a respective one of said projection face surfaces; and

means for forcing said projection face surfaces into intimate engagement with said tapered sidewalls of said notch when said distributor is assembled on said engine whereby distributor drive backlash is substantially eliminated.

4,403,580

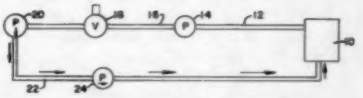
SHUT-DOWN APPARATUS FOR DIESEL ENGINES

Hans Bader, Laroe Rd., Chester, N.Y. 10918

Filed Dec. 19, 1980, Ser. No. 218,427

Int. Cl.³ F02M *63/02*

U.S. Cl. 123—198 DB **6 Claims**



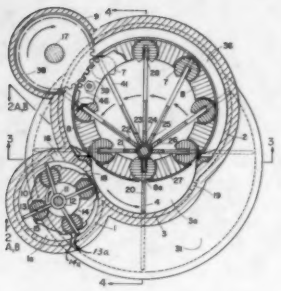
1. A fuel supply control circuit and apparatus in which fuel from a supply tank is delivered by a transfer pump to an injector pump by which fuel is delivered at a given flow rate through a supply conduit and delivered in a metered condition to an internal combustion engine and with any excess fuel delivered to and not used by the injector pump returned to the fuel tank by and through a return conduit, said circuit and apparatus further including signal means for terminating the flow of fuel to the injector pump by and with an electrically actuated shut-off valve in the supply conduit from transfer pump to the injector pump and there is provided in said return conduit an electrically actuated return flow fuel pump, both the shut-off valve and return flow fuel pump being actuated in response to the same signal actuation of said intended flow of fuel to the injector pump being affectively terminated and the engine ceases to run due to an absence of fuel.

4,403,581

ROTARY VANE INTERNAL COMBUSTION ENGINE

George Rogachevsky, 8 Birchwood Ave., Spring Valley, N.Y. 10977

Continuation-in-part of Ser. No. 42,993, May 29, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,262
Int. Cl.³ F02B 53/08
U.S. Cl. 123—239 35 Claims



1. A rotary-vane internal combustion engine comprising:

a. A compressor unit having a chamber for forming, compressing, and igniting a combustible fluid mixture and comprising:

1. a first rotor mounted eccentrically within the compressor chamber,

2. a plurality of compressor vanes mounted for rotation with said first rotor, and

3. means for igniting the compressed combustible mixture to form a working fluid,

b. A power unit having a chamber comprising

1. a power shaft disposed within the power chamber,

2. a second rotor mounted within said power chamber and eccentrically disposed with respect to said second shaft.

3. a plurality of radially disposed power vanes having one end thereof pivoted on said power shaft,

4. a plurality of slotted vane guide elements disposed in said second rotor for receiving respective ones of said power vanes in the said slots during only a part of the operating cycle of said engine, said power vanes being adapted to be withdrawn from the slots of their respective guide elements during other parts of said operating cycle,

5. Guide arm means connected to respective ones of said power vanes, said guide arm means continuously engaging respective ones of said vane guide elements, whereby said guide elements are adjusted to maintain their slots and their associated power vanes in alignment, and

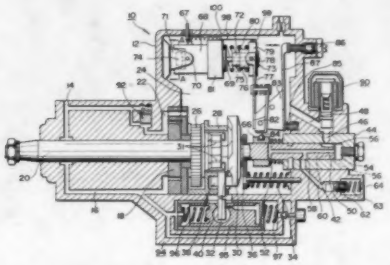
6. An expansion chamber connected to the compressor unit for receiving the ignited combustible fluid and forming an extension of said power chamber, said power vanes extending into and forming a sealing relationship with said expansion chamber and forming variable volume working chambers for the expansion of the working fluid.

4,403,582

FUEL INJECTION CONTROL SYSTEM

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 26, 1981, Ser. No. 277,818
Claims priority, application Japan, Sep. 10, 1980, 55-124639
Int. Cl.³ F02D 31/00
U.S. Cl. 123—357 7 Claims



1. A fuel injection control system for an internal combustion engine, comprising:

(a) a housing;

(b) a fuel distributing plunger disposed within the housing and moving angularly and axially therein in synchronism with the engine, said plunger having a spill port opening outwardly;

(c) a control sleeve slidably fitted over said plunger to open and close said spill port to control the amount of fuel injected into the engine as a function of axial position of the sleeve;

(d) a reversible electric motor disposed within the housing and having a threaded motor shaft;

(e) a slider disposed within the housing in threaded engagement with the motor shaft to thereby move along the motor shaft during rotation thereof;

(f) a linkage for transmitting movement of the slider to the control sleeve through a connecting member to move the sleeve axially as the slider moves; and

(g) an urging device biasing the motor shaft circumferentially to thereby rotate said shaft to a predetermined position when a motor output force exerted on the shaft stops; said predetermined position of the motor shaft being the same as that during engine idling operation;

whereby the amount of fuel injected into the engine is made small enough to maintain safe engine operation if the force exerted on the motor shaft stops due to a malfunction.

4,403,583

FUEL INJECTION PUMP

Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,888
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1979, 2909555
Int. Cl.³ F02D 17/06
U.S. Cl. 123—387 19 Claims

1. A fuel injection pump with a housing and hydraulic rpm governor for internal combustion engines, the fuel injection pump having:

a supply pump with a suction chamber in which fuel is driven by the supply pump at a pressure depending on engine rpm, and wherein the supply pump is driven at an rpm also depending on engine rpm;

an adjusting piston in the housing, with an end face exposed to the supply pump fuel such that the adjusting piston is moved in a first direction;

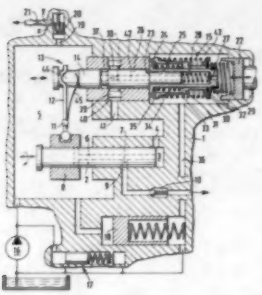
a spring unit with an rpm governing spring connected to and controlled by the hydraulic rpm governor and also connected to move the adjusting piston in a second direction;

an adjusting lever connected to operate the spring unit such that an adjustment of the adjusting lever varies the tension in the rpm governor spring;

a distributor mounted in the housing parallel to the adjusting piston;

an annular slide mounted on the distributor;

a governor lever having first and second ends, which is mounted on a pivot and is connected at the first end to be



operated by the adjusting piston and connected at the second end to the annular slide to position the annular slide on the distributor;

said spring unit having at least two additional springs of unequal strength, a first spring of said spring unit functioning as a starting spring and cooperating with said adjusting piston and a second spring of said spring unit cooperating with said governor spring, said second spring arranged to engage said adjusting piston via cap which is supported during starting on said housing and guided on said adjusting piston.

4,403,584

METHOD AND APPARATUS FOR OPTIMUM CONTROL FOR INTERNAL COMBUSTION ENGINES

Atsushi Suzuki, and Masakazu Ninomiya, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 2, 1981, Ser. No. 298,613

Claims priority, application Japan, Sep. 5, 1980, 55-123817

Int. Cl.³ F02D *37/02*

U.S. Cl. 123—417 **8 Claims**

1. A method for optimum control for internal combustion engines using memory means preliminarily storing, in the form of maps, values of ignition timing and air-fuel ratio as control variables of an internal combustion engine in accordance with parameters indicative of operating conditions of said engine and alternately performing an ignition timing optimizing control and an air-fuel ratio optimizing control, wherein:

said ignition optimizing control executing at least one cycle of an ignition timing optimization processing comprising:

operating said engine, with the value of air-fuel ratio being maintained constant at a value stored in the map, at at least two ignition timings including one of said stored values of ignition timing for a predetermined time period,

detecting signals indicative of one of engine rotational speed and engine output torque resulting from the operations of said engine at said at least two ignition timings, respectively,

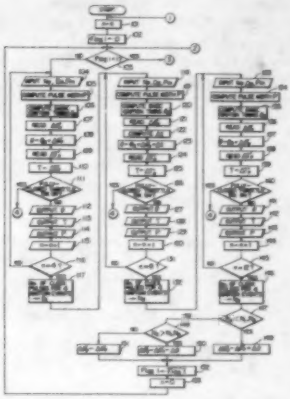
comparing with one another said detection signals resulting from the operations of said engine over at least three successive ones of said predetermined time periods among said detection signals resulting from the operations of said engine at said at least two ignition timings,

deciding from the result of the comparison a direction of correction in which the rate of fuel consumption of saidengine is to be improved, and

correcting in said direction said one of said stored values of ignition timing; and

said air-fuel ratio optimizing control executing at least one cycle of an air-fuel ratio optimization processing comprising:

operating said engine, with the value of ignition timing being maintained constant at a value stored in the map, at at least two air-fuel ratios including one of said stored values of air-fuel ratio for a predetermined time period,



detecting signals indicative of one of engine rotational speed and engine output torque resulting from the operations of said engine at said at least two air-fuel ratios, respectively,

comparing with one another said detection signals resulting from the operations of said engine over at least three successive ones of said predetermined time periods among said detection signals resulting from the operations of said engine at said at least two air-fuel ratios,

deciding from the result of the comparison a direction of correction in which the rate of fuel consumption of said engine is to be improved, and

correcting in said direccion said one of said stored values of air-fuel ratio.

4,403,585

FUEL INJECTION NOZZLE SYSTEM

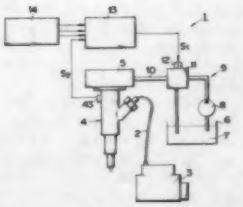
Tomonori Ohie, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,085

Claims priority, application Japan, Dec. 15, 1980, 55-175762

Int. Cl.³ F02D *1/04;* **F02M** *39/00*

U.S. Cl. 123—446 **12 Claims**



1. A fuel injection nozzle system for use in injecting fuel into an internal combustion engine, comprising:

an injection-valve which is capable of being adjusted in its injection-valve opening pressure;

means for adjusting the opening pressure of said injection-valve;

at least one sensor for detecting a condition of the operation of said engine;

a first citcuit responsive to the output signal from said sensor for generating a first signal indicative of a target value of the injection-valve opening pressure which is in accord with the condition of the operation of said engine;

a second circuit for generating a second signal indicative of the actual set value of the opening pressure of said injection-valve set by said adjusting means; and

a third circuit responsive to said first signal and said second signal for generating a third signal for driving said adjusting means in such a way that said actual value is coincident with said target value.

4,403,586

FUEL INJECTION PUMP OF INTERNAL COMBUSTION ENGINE

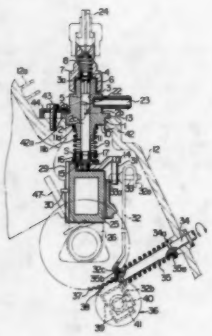
Hiroyuki Taniguchi, Otsu, Japan, assignor to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed Jul. 11, 1980, Ser. No. 167,463

Claims priority, application Japan, Dec. 11, 1979, 54-172046[U]; Dec. 11, 1979, 54-172047[U]; Dec. 17, 1979, 54-175384[U]; Dec. 17, 1979, 54-175385[U]; Dec. 18, 1979, 54-175910[U]; Dec. 18, 1979, 54-175911[U]; Dec. 26, 1979, 54-183206[U]; Dec. 28, 1979, 54-183217[U]; Dec. 28, 1979, 54-183218[U]

Int. Cl.³ F02M *39/02*

U.S. Cl. 123—509 **3 Claims**



1. A fuel injection pump of an internal combustion engine comprising:

a pump body;

a disk-shaped flange formed integrally with said pump body at an intermediate portion thereof for positioning and securing said pump body directly to an engine body;

a plunger;

a plunger sliding bore formed in said pump body for receiving said plunger for sliding reciprocatory movement;

a discharge valve mounted on an end portion of said plunger sliding bore corresponding to an upper end portion of said plunger so that said end portion of said plunger sliding bore can guide said discharge valve;

a guide cylinder formed in a lower end portion of said pump body and having an annular engaging surface supporting an upper end portion of a plunger returning spring force fitted thereon; and a spring rest mounted on a lower end of said plunger returning spring force fitted thereon, whereby said pump body and said plunger can be unitarily connected to eafh other through said plunger returning spring, wherein said annular engaging surface of said pump body and an outer peripheral surface of said spring rest are each formed with a spring engaging recess, and said plunger returning spring has radially inwardly bent portions each formed at one of upper and lower ends thereof, said radially inwardly bent portions of said plunger returning spring being received and secured in said spring engaging recess of said pump body and said spring engaging recess of said spring rest.

4,403,587

FUEL EVAPORATIVE EMISSION CONTROL APPARATUS FOR VEHICLES

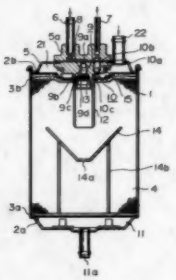
Junzi Mizuno; Akira Fuksmi, both of Okazaki; Hiroki Noguchi, Obu, and Takeshi Ishii, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Mar. 18, 1982, Ser. No. 359,298

Claims priority, application Japan, Mar. 23, 1981, 56-40410

Int. Cl.³ F02M *37/02*

U.S. Cl. 123—519 **18 Claims**



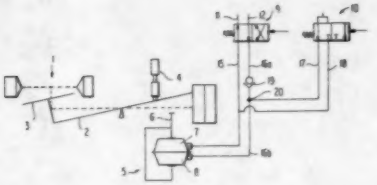
1. A fuel evaporative emission control apparatus for vehicles which comprises a cylindrical vessel in which an adsorbent for adsorbing a vaporized fuel is filled so that open spaces are formed on both ends of the vessel, a vaporized fuel inlet conduit connected to a fuel tank, said conduit being inserted in a layer of said adsorbent from one end of said vessel, and an air-fuel mixture discharge conduit for discharging an air-fuel mixture desorbed from said adsorbent to the outside of said apparatus, said air-fuel mixture discharge conduit being connected to one of said open spaces at the ends of the vessel with the other open space being used as a purge chamber communicated with the open air, wherein the improvement comprises a flow deflector of hollow conical shape or hollow conical frustrum shape having a diameter gradually increasing toward said vaporized fuel inlet conduit, said deflector being embedded in said adsorbent layer coaxially with said vaporized fuel inlet conduit to confront said vaporized fuel inlet conduit, a vertical angle (α) of said flow deflector is adjusted to 60° to 120°, the ratio (S1/S2) of a sectional area (S1) of a largest-diameter end portion of said flow deflector to a sectional area (S2) of said adsorbent layer is adjusted to 0.4 to 0.6, the ratio (a/b) of a distance (a) between the largest-diameter end portion of said flow deflector and a top end of said adsorbent layer to a distance (b) between said largest-diameter end portion of said flow deflector and a side end of said adsorbent layer is adjusted to at least 1.5, and said distance (a) is made smaller than the sum (g+b) of said distance (b) and a length (g) of said vaporized fuel inlet conduit in said adsorbent layer in an axial direction.

4,403,588

FUEL INJECTION SYSTEM FOR OTTO ENGINES

Dietrich Fischer, Berglen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 16, 1981, Ser. No. 274,187
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022632
Int. Cl.³ F02M 21/02
U.S. Cl. 123—525 11 Claims



1. A mechanism for the selective operation of Otto engines by means of gaseous and liquid fuels having a throttling member, that can be blocked by a pin, and a double-acting vacuum element which, on the one hand, can be acted upon by vacuum coming from an intake pipe and, on the other hand, by atmospheric pressure, characterized in that the mechanism is intended for a fuel-injection system having mixture controls, and comprises

an air meter and a fuel-volume divider means, where the pin can be adjusted by means of a vacuum element;

two duct means are connected to the vacuum element; and

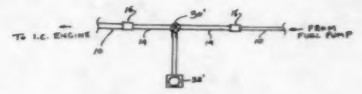
the pair of duct means branches into two respective pairs of ducts which are parallel to one another, where one pair of ducts is connected with a 4/2-way valve means, and the other pair of ducts is connected with a 3/2-way valve means.

4,403,589

SPARE TANK SYSTEM FOR MOTOR VEHICLE

John G. Bowen, 11521 Heathcliff Ave., Santa Ana, Calif. 92705, and Eugene N. Kovalenko, 461 Peralta, Long Beach, both of Calif. 90803

Continuation-in-part of Ser. No. 160,975, Jun. 19, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,224
Int. Cl.³ F02M 21/02
U.S. Cl. 123—525 5 Claims



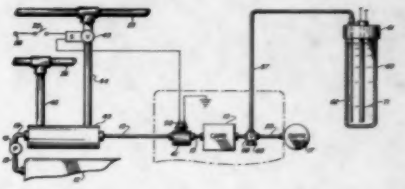
1. A spare tank emergency fuel system for an internal combustion engine of a motor vehicle comprising: a conduit adapted to be interposed in the fuel line of the internal combustion engine; a valve mounted in said conduit and having a first position for permitting the free flow of fuel through the fuel line and through the conduit from the normal fuel supply system to the internal combustion engine, and said valve also having a second position for isolating the normal fuel supply system from the internal combustion engine; a pressurized container of fuel constituting an auxiliary fuel source and having a nozzle; and a fitting coupled to the conduit for receiving the nozzle to enable the fuel to flow from the pressurized container through the conduit to the internal combustion engine when the valve is in its second position.

4,403,590

ENGINE FUEL CONSUMPTION REDUCTION SYSTEM

James P. Davis, Anaheim, Calif., assignor to Rodew International, Alta Loma, Calif.

Continuation of Ser. No. 18,507, Mar. 8, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 285,413
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 1 Claim



1. A system for increasing the fuel economy of an engine fueled by a liquid petroleum fuel and having a source of fuel and a fuel distributing device, said system including in combination:

heating means having a fuel inlet and a fuel outlet located between said source of fuel and said fuel distributing device for heating said fuel to a predetermined temperature;

a linear fuel line located within said heating means;

an enlarged fuel chamber located within the heating means and positioned at the output portion of said linear fuel line for providing more accurate temperature control;

said heating means having proximity to said fuel distributing device;

insulating means at least partially surrounding said herating means for substantially thermally isolating said heating means at the location where said heating means is transferring heat to said fuel;

sensing means located within said insulating means and within said enlarged fuel chamber for sensing the temperature of fuel entering said fuel distributing device for controlling the temperature of said fuel at said predetermined temperature;

said sensing means comprising a thermostatic switch means coupled with said heating means for turning off said heating means when the temperature of said fuel entering said fuel distributing device exceeds said predetermined temperature by a predetermined amount;

said engine comprising a liquid cooled engine having a cooling system;

said heating means comprising a heat exchanger connected with said engine cooling system to obtain heat therefrom;

said fuel being supplied from the source of fuel to said fuel distributing device through a fuel line coupled in heat exchanging relationship with said heat exchanger;

means for supplying fluid from said engine cooling system to said heat exchanger;

a valve for controlling the flow of heating fluid from said engine cooling system through said heat exchanger so that said sensing means can operate to open said valve when the temperature of said fuel is above said predetermined temperature;

said valve comprising an electrically operated valve;

said temperature sensing means comprising said thermostatic switch means connected in series with said electrically operated valve across a voltage supply;

said enlarged chamber means comprising a heat chamber disposed proximal to said heating means outlet so that a portion of said thermostatic switch means is placed in said fuel proximal to and in communication with said fuel distributing device;

said fuel comprising gasoline; and

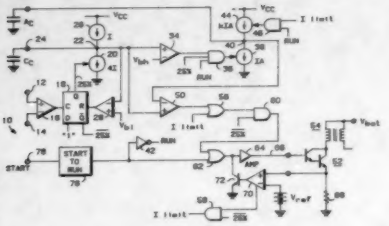
said predetermined temperature having a range of about 115° F. to about 130° F.

4,403,591

IGNITION SYSTEM HAVING VARIABLE PERCENTAGE CURRENT LIMITING

Howard F. Weber, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 13, 1981, Ser. No. 253,770
Int. Cl.³ F02P 9/00
U.S. Cl. 123—609 9 Claims



1. An adaptive dwell ignition system for engine control wherein the excess dwell current time during which the magnitude of current in an ignition coil is limited prior to discharge thereof is caused to be varied in response to variations in engine rpm, the ignition system which is responsive to the initiation of timing signals generated in timed relationship with the engine to charge and discharge the coil includes a threshold circuit for producing a variable threshold signal whereby the percent of excess dwell current time in each firing cycle period is varied, the improvement comprising the threshold circuit being responsive to the initiation of each firing cycle period for causing the magnitude of the threshold signal to be decreased at a first rate during a predetermined percent of the firing cycle period minus a predetermined constant time interval of said percent of firing cycle period during which interval the magnitude of the threshold signal is held constant, the threshold circuit maintaining said magnitude of the threshold signal substantially constant thereafter until current limiting occurs at which time the magnitude of the threshold signal is caused to be increased at a second rate until the coil is discharged.

4,403,592

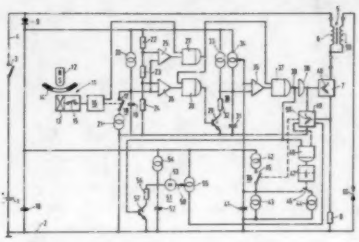
ENGINE IGNITION SYSTEM WITH AUTOMATIC TIMING SHIFT

Adolf R. Fritz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,255
Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118679
Int. Cl.³ F02P 1/00
U.S. Cl. 123—609 8 Claims

1. An ignition system for an internal combustion engine comprising an ignition coil (5) having primary and secondary windings, an interruptor switch (7) having its switching path in series with said primary winding and a source of voltage, means including an engine-driven generator (11) and a switching path (15) controllable by said generator for causing the switching path of said interruptor switch (7) to go from its conducting state into its blocking state at an ignition instant suitable for producing a spark in a circuit connected to said secondary winding, and a main electric storage circuit (30) for providing a first control voltage acting after said ignition initiation by said switching path (15) controlled by said generator (11) for timing return of said path of said interruptor switch to a conducting condition in a manner utilizing in alternation a first voltage change (f) in one direction and a second voltage change (l) more gradual than the first and in the opposite direction, and means responsive to said control voltage reaching a first threshold value (m) in the course of said second voltage change (1) for causing a change of the condition of said interruptor switch path to a conducting condition, as well as means for modifying said first threshold voltage (m) by application of a regulating value (q) dependent at least in part on the engine speed, said ignition system further comprising, in accordance with the invention:

an auxiliary electric storage circuit (18) for providing a second control voltage acting after said ignition initiation by said switching path (15) controlled by said generator (11), includ-



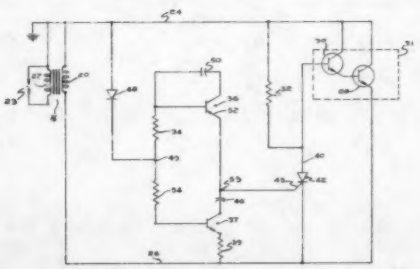
ing means for generating an auxiliary signal (c) beginning at the moment of said ignition initiation and having a signal duration which is at least coextensive in time with the duration of said first voltage change (f) of said main electric storage circuit (30), and at the same time causing a first voltage change (d) to take place in said auxiliary electric storage circuit (18), said first voltage change (d) being followed by a second voltage change in the opposite direction, the beginning of which is timed by the return to a conducting state of said switching path (15) under control of said generator (11).

4,403,593

ELECTRONIC SWITCHING FOR SOLID STATE IGNITION

Michael J. Piteo, Enfield, Conn., assignor to R. E. Phelon Company, Incorporated, East Longmeadow, Mass.

Filed Feb. 1, 1982, Ser. No. 344,609
Int. Cl.³ F02P 1/08
U.S. Cl. 123—651 6 Claims



1. In a breakerless ignition system for internal combustion engines having an ignition transformer including a primary coil associated with a rotating magnetic means for inducing current in the primary coil whose frequency is directly related to the engine rpm and in which said coil is connected into a primary current circuit containing an electronic switching means for making and breaking the circuit, a control circuit for actuating said switching means at a predetermined position of rotation of the magnetic means, said control circuit connected to receive

a portion of the current from the primary circuit and including a capacitor for storing voltage which, at a predetermined level, causes actuation of said electronic switching means; said control circuit including an input branch for controlling the rate of charging of the capacitor as a function of the frequency of the current pulses generated in the primary coil whereby, as the engine rpm increases, the feed rate for charging said capacitor decreases.

4,403,594

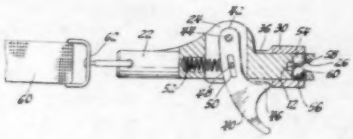
BOW STRING RELEASE

Gary J. Todd, 8324 Southfield Dr., Utica, Mich. 48087

Filed Dec. 21, 1981, Ser. No. 332,470

Int. Cl.³ F41B 5/00

U.S. Cl. 124—35 A **3 Claims**



1. A bow string release device comprising:

a body having a slot for receiving a bow string;

a pair of balls mounted in said body on opposite sides of the slot, said balls being relatively movable from a first position in which they are adjacent one another and engage the bow string to prevent removal thereof from said slot, toward a second position in which they permit passage of the bow string therebetween;

a release member comprising a sleeve having an opening, the body being slideably mounted in the opening for movement between a string-retaining position in which the slot in the body is disposed within the sleeve to prevent movement of the balls from said first position, and a release position in which the slot in the body extends beyond the sleeve permitting movement of the balls toward said second position; and

means connected to the release member for moving it from the string-retaining position to the release position as at such times as said pair of balls are engaged with a bow string.

4,403,595

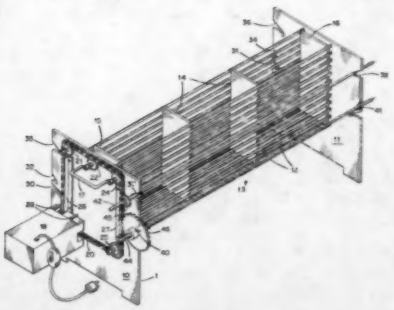
BARBECUE GRILL

Stanley J. Maesk, 39 Celeste St., Manchester, N.H. 03103

Filed Jun. 2, 1981, Ser. No. 269,698

Int. Cl.³ A47J 37/00

U.S. Cl. 126—25 A **2 Claims**



1. A barbecure grill comprising:

(a) a first end support;

(b) a second end support;

(c) a plurality of metal strips extending from said first end support to said second end support so as to form a cage open at the top;

(d) a plurality of matching slots around the peripheries of said first end support and said second end support for receiving rotatable spits, said slots being lateral of said cage and provided with a plurality of different depths whereby the distance of a spit from said cage can be selected;

(e) a motor driven chain mounted on said first end support with said chain supported on sprockets so as to pass adjacent to said slots; and,

(f) spits having sprockets of a plurality of different diameters whereby a spit having a large diameter sprocket will be driven by said chain when placed in a shallow slot and a spit having a small diameter sprocket will be driven by said chain when placed in a deep slot.

4,403,596

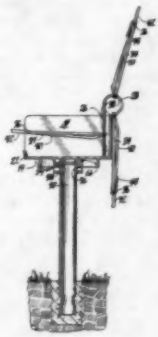
STRONG CANTILEVERED PARK GRILL

Craig R. Thomas, Cherokee, Iowa, assignor to R. J. Thomas Manufacturing Co., Cherokee, Iowa

Filed Feb. 22, 1982, Ser. No. 350,988

Int. Cl.³ A47J 37/00; F16M 13/00

U.S. Cl. 126—25 A **8 Claims**



1. An outdoor park grill of superior strength and resistance to wear, vadalism and deformation stress, comprising:

a firebox having a bottom, a pair of spaced apart sidewalls, a back wall and an open front;

a pair of spaced apart vertically oriented grate posts attached to said bottom and extending upwardly out of said firebox and looping around to engage the backwall of said firebox;

an adjustable grate for extension over the firebox defined by spaced apart grate sidebars and front and rear bars extending between said sidebars, and a plurality of rack bars extending therebetween;

said grate sidebars having a front handle portion and a rear eyelet which slidably engages said grate posts and also dwells in a different plane than said rack bars to provide a combination of compression and tension when downward pressure is placed on said handle portions.

4,403,597

HEAT TRANSFER DEVICE

Don J. Miller, 5036 Barron Dr. NW., Calgary, Alberta, Canada (T2E 6R7)

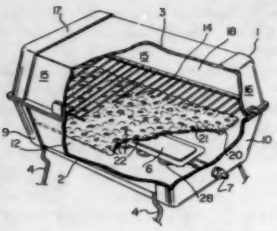
Filed Jan. 16, 1981, Ser. No. 225,662

Int. Cl.³ A47J 37/00; F23D 3/40

U.S. Cl. 126—41 R **5 Claims**

1. In a gas barbecue of the type including burner means, food

support means for supporting food above the burner means, and a heat transfer device between said burner means and said support means, all enclosed within a casing having an openable cover, the improvement wherein said heat transfer device comprises at least one solid one-piece, metal heat conducting plate of sufficient thickness and strength to be self-supporting in span if supported at its edges, and having a generally continuous surface formed with a plurality of spaced openings in said plate separated by substantial surface portions of the plate, said



openings extending through said plate from the top surface to the bottom surface thereof, the top surface of said plate being formed with projections and depressions to resemble a lava bed or charcoal, the areas of said top surface around each of said openings being inclined toward said openings to promote the flow of food juice droplets into and through said openings, the inclinations and extent of said areas being such that in use at least a substantial number of food juice droplets at least partially vaporize while floating on vapor films and flowing along said areas toward said openings.

4,403,598

HEATING ELEMENT FOR AN OPEN FIREPLACE

Cono T. Scaffidi, 3401 E. Pratt St., Baltimore, Md. 21224

Filed Nov. 24, 1980, Ser. No. 209,879

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—121 **10 Claims**

1. A substantially indistinguishable heating element for an open fireplace, comprising:

a first jacket means, the interior of said first jacket means being hollow, said first jacket means serving as a bottom;

a second jacket means, the interior of said second jacket means being hollow, said second jacket means being affixed to said first jacket means, said hollow interiors of said first and second jacket means communicating with each other, said second jacket means serving as a first side;

a third jacket means, the interior of said third jacket means being hollow, said third jacket means being affixed to said first jacket means, said hollow interiors of said first and third jacket means communicating with each other, said third jacket means serving as a second side;

an inlet means, said inlet means being pipe-like, said inlet means being affixed to said second jacket means, said pipe-like inlet means communicating with said interior of said second jacket means;

an outlet means, said outlet means being pipe-like, said outlet means being affixed to said third jacket means, said pipe-like outlet means communicating with said interior of said third jacket means;

a communicating means, said communicating means being pipe-like, said communicating means being affixed to and between said second and third jacket means, said pipe-like communicating means communicating with said interiors of said second and third jacket means, said first, second, and third jacket means, said inlet and outlet means, and said communicating means forming a heating element for installation in an open fireplace, said communicating means being obscured from view when installed in said open fireplace;

brick-like scoring, said brick-like scoring being applied to the innermost of outer surfaces of said second and third jacket means, said brick-like scoring conveying a brick-like appearance; and

a ceramic-like coating, said ceramic-like coating being heat resistant and non-insulating, said ceramic-like coating being applied to said innermost of outer surfaces of said second and third jacket means over said brick-like scoring.

4,403,599

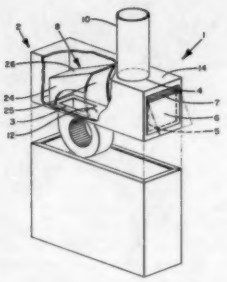
SPILLAGE DAMPER FOR A COMBUSTION SYSTEM

Lloyd F. Copenhaver, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,855

Int. Cl.³ F23J *11/00*

U.S. Cl. 126—312 **3 Claims**



1. A flue gas discharge box for a combustion system having a fan unit which directs gaseous products of combustion from a heat exchanger assembly through said discharge box to a flue pipe, said discharge box comprising:

a housing sized and positioned to provide a negative pressure region through which the combustion products pass on their way to the flue pipe;

a first opening in the housing for receiving the combustion products directed to the housing by the fan unit;

a second opening in the housing connected to the flue pipe for discharging the combustion products from the housing into the flue pipe;

a third opening in a vertical sidewall of the housing; and

a movable panel, pivotally connected to the housing above the third opening to hang in a substantially vertical position, for covering the opening in the housing during normal operation of the combustion system when the pressure in the housing is less than surrounding atmospheric pressure whereby the panel is forced closed by the pressure difference across the panel, and for uncovering the opening in the housing when the pressure in the housing is greater than surrounding atmospheric pressure whereby the panel is forced open by the pressure difference across the panel.

4,403,600

MODULAR SOLAR HEATING SYSTEM

Herbert F. Morrison, R.D. No. 7, 46 Boniello Dr., Mahopac, N.Y. 10541, and David A. Miller, 2 Beverly La., Marlborough, Conn. 06447

Filed Dec. 7, 1981, Ser. No. 327,955

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—429 **6 Claims**

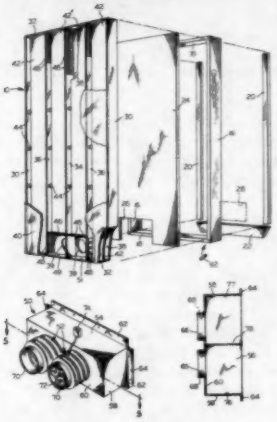
1. An active solar heating system adapted for retrofit installation in a building, with minimal structural modification thereto, comprising:

(1) a solar collector module adapted for mounting upon an outside building wall, including a frame having disposed therein a transparent front panel and a spaced generally

parallel rear panel defining an air flow space therebetween, and at least one member dividing said space, in a plane perpendicular to the planes of said front and rear panels, into two chambers, said rear panel having a pair of adjacent apertures formed therethrough near one end of said module, one of said apertures communicating with each of said chambers and said apertures being substantially isolated from one another by said dividing member, said chambers being in air flow communication with one another adjacent the opposite end of said module, thereby establishing a double-pass air flow path between said apertures through said module; and

(2) a plenum box assembly for actively circulating room air through said module, said assembly including:

(a) a box defining a plenum with an open front side, and adapted for installation in an opening formed through the building wall, with said open side disposed to the interior of the building and lying substantially in the



plane of the interior wall surface, said box having an internal barrier member dividing said plenum into two adjacent compartments, and a rear wall with a pair of passages formed therethrough, each communicating with one of said plenum compartments,

(b) a pair of flexible conduits connected to said box and said module with one of said conduits providing air flow communication between one of said compartments of said plenum box and one of said chambers of said module through said passages and apertures thereof, respectively, and

(c) blower means mounted substantially within one of said conduits for inducing such air flow circulation,

whereby said system is readily installed by forming an opening through an outside wall of the building, mounting said module exteriorly thereon and mounting said plenum box within said opening, and establishing air flow communication between said module and said box by connecting said conduits therebetween.

4,403,601

RADIATION RECEIVER

Arlon J. Hunt, Oakland, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Division of Ser. No. 61,165, Jul. 26, 1979, Pat. No. 4,313,304. This application Mar. 13, 1981, Ser. No. 243,396

Int. Cl.³ F24J 3/02

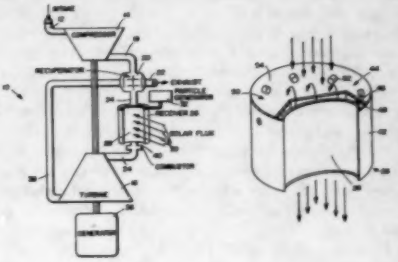
U.S. Cl. 126—435 **9 Claims**

1. A radiation receiver comprising:

a housing having an interior space;

at least one radiation transparent window provided in the periphery of said housing for allowing radiation to be received in the interior space of said housing;

a radiation transparent heat shield spaced from said radiation transparent window wherein said heat shield divides said interior space into a first compartment defined between said window and said heat shield and a second compartment;



means for passing a first stream of fluid through said first compartment and a second stream of fluid through said second compartment; and

means for injecting solar radiation absorbent vaporizable particles into the stream of fluid passing through said second compartment, whereby agglomeration of the particles is eliminated and partical damage to associated turbine blades is prevented.

4,403,602

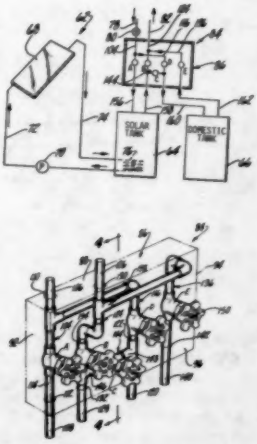
CONTROL VALVE UNIT FOR SOLAR ENERGY SYSTEM

Jerry T. Warden, 2806 Midwood, Lansing, Mich. 48910

Filed Mar. 8, 1982, Ser. No. 355,917

Int. Cl.³ F24J 3/02

U.S. Cl. 126—435 **12 Claims**



5. A control valve unit for controlling the flow of water through a solar energy system that includes a cold water supply, a hot water supply, a solar energy heated water storage tank having an inlet and an outlet, and a conventionally heated water storage tank having an inlet and an outlet, said control valve unit comprising, in combination, a housing, a first inlet pipe, first valve means controlling the flow of water through said first inlet pipe, a second inlet pipe, one end portion of said

second inlet pipe being connected to said first inlet pipe at a position upstream of said first valve means, second valve means controlling the flow of water through said second inlet pipe, a first outlet pipe, third valve means controlling the flow of water through said first outlet pipe, a second outlet pipe, one end portion of said second outlet pipe being connected to said first outlet pipe at a position downstream of said third valve means, fourth valve means controlling the flow of water through said second outlet pipe, a cross pipe, one end portion of said cross pipe being connected to said first outlet pipe at a position upstream of said third valve means, the opposite end portion of said cross pipe being connected to said inlet pipe at a position downstream of said second valve means, and fifth valve means controlling the flow of water through said cross pipe, one end portion of said first inlet pipe being connectible to said cold water supply, the other end portion of said first inlet pipe being connectible to said inlet of said solar energy heated tank, the other end portion of said second inlet pipe being connectible to said inlet of said conventionally heated tank, one end portion of said first outlet pipe being connectible to said hot water supply, the other end portion of said first outlet pipe being connectible to said outlet of said solar energy heated tank, the other end portion of said second outlet pipe being connectible to said outlet of said conventionally heated tank.

4,403,603

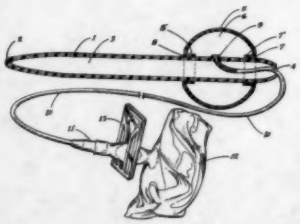
METHOD TO ENHANCE ARTIFICIAL DOG BREEDING

Rhonda P. Hutchins, 414 C Old Jamestown Rd., Florissant, Mo. 63034

Continuation of Ser. No. 81,695, Oct. 4, 1979, abandoned. This application May 4, 1981, Ser. No. 260,261

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **4 Claims**



1. A method for promoting artificial breeding in dogs comprising; artificially inseminating a female dog, then inserting into the vagina of the dog the forward, phallic-simulative end portion of an elongated body having a surrounding fluid-inflatable chamber for disposition immediately distally of the constrictor vestibuli muscle of the female, inflating said chamber to be fluid-inflated for excitation of the vaginal musculature of the dog, whereby the constrictor vestibuli muscle contracts about said elongated body immediately rearwardly of said now inflated chamber developing a tie-forming relationship between said inflated chamber and said constrictor vestibuli muscle, holding said chamber inflated for a period of time approximating the interval for such tie during normal mating, then deflating said chamber, and then withdrawing said phallic-simulative end portion.

4,403,604

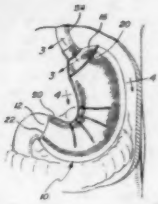
GASTRIC POUCH

Lawrence H. Wilkinson, and Lanette L. Wilkinson, both of 1516 Columbia Dr., NE., Albuquerque, N. Mex. 87106

Filed May 13, 1982, Ser. No. 378,004

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R **7 Claims**



1. The method of reduction of the capacity of a stomach, said method comprising the provision of an elongated generally rectangular flexible wrap panel having opposite ends and opposite side marginal edges and with the opposite side marginal edges each including longitudinally spaced laterally outwardly opening and inwardly tapering notches formed therein intermediate the opposite ends of the panel, a generally annular flexible yoke panel having adjacent opposing ends and a narrow elongated flexible strip panel, suturing the outer periphery of the yoke panel across one end of the wrap panel, suturing one longitudinal edge of the strip panel to the inner peripheral edge of the yoke panel, overlapping and suturing together the opposing edges of the wrap panel defining each notch to form darts in the panel and thereby conform the wrap panel to the shape of a stomach, placing the wrap panel along the greater curvature of the stomach with the central longitudinal zone of the wrap panel inwardly of the notches generally centered relative to the greater curvature, and thereafter suturing the opposite side marginal edges of the wrap panel snugly about the stomach, suturing the opposing ends of the yoke panel together about the esophagogastric junction and suturing the opposite ends of the strip panel together about the esophagus as well.

4,403,605

ENDOSCOPE PHOTOGRAPHING SYSTEM

Kowji Tanikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1981, Ser. No. 255,692

Claims priority, application Japan, Apr. 25, 1980, 55-55008

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **13 Claims**

1. In an endoscope photographing system which includes an endoscope, an endoscope camera optically coupled to said endoscope and a light source unit optically coupled to said endoscope,

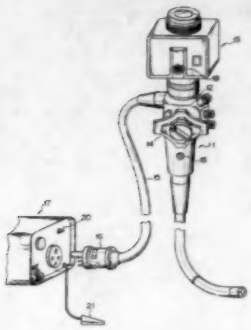
the improvement comprising:

at least two releasing means which are independently operable for initiating a photographing operation of said endoscope photographing system, each of said at least two releasing means being arranged on a respective different one of said endoscope, said endoscope camera and said light source unit;

release signal generating means coupled to each of said at least two releasing means for generating a release signal in response to the operation of any one of said releasing means;

means coupled to said release signal generating means for

executing a photographing operation cycle of said endoscope photographing system in response to a release signal generated by said release signal generating means; and



means for disabling another release signal generated in response to the operation of another of said releasing means during said executing of said photographing operation cycle which was initiated responsive to operation of the first operated one of said releasing means.

4,403,606

COMPATIBLE INTERNAL BONE FIXATION PLATE

Savio L-Y. Woo, Encinitas, and Wayne H. Akeson, La Jolla, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed May 9, 1980, Ser. No. 148,204

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 D **8 Claims**

1. A compatible internal fixation plate for diaphyseal bone fractures comprising:

a hollow elongated flat metal plate formed of biologically inert material;

said plate being provided with a plurality of transverse openings at each end for securing the plate to the bone on both sides of the fracture;

said plate including means for providing high bending and torsional stiffness but relatively low axial stiffness relative to a conventional solid metal fixation plate, said means including a continuous outer metallic surface with opposed inner walls spaced apart from one another to form a hollow metal-free central zone;

means for precluding bone ingrowth into the metal-free central zone of said plate; and

said plate including continuous integral structural metallic means extending between said openings at each end of said plate;

whereby bending and torsional rigidity is provided for early fracture healing, and the low axial stiffness of the plate inhibits osteoporosis and bone weakening during later stages of bone remodeling before the plate is removed.

4,403,607

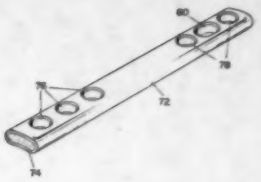
COMPATIBLE INTERNAL BONE FIXATION PLATE

Savio L-Y. Woo, Encinitas; Wayne H. Akeson, La Jolla, both of Calif., and Dan L. Page, Warsaw, Ind., assignors to The Regents of the University of California, Berkeley, Calif.

Filed May 9, 1980, Ser. No. 148,205

Int. Cl.³ A61F *5/04*; A61B *17/18*

U.S. Cl. 128—92 D **10 Claims**



8. A compatible internal bone fixation plate comprising:

an anisotropic elongated bone fixation member formed of biologically inert tubular stock material, with a cross-sectional configuration having a closed integral outer periphery;

said bone fixation member including means for providing a relatively high level of resistance to bending and torsional forces comparable to that of conventional solid metallic fixation plates, and for concurrently providing a relatively low axial stiffness comparable to that of a bone, and substantially less than that of conventional solid metallic fixation plates;

said plate being provided with a plurality of transverse openings at each end thereof for securing the plate to a bone on each side of a fracture;

said plate including unitary or integral structural means extending between the transverse openings at each end of said plate; and

means for preventing bone ingrowth into said anisotropic plate, said plate having a substantially impervious outer surface;

whereby initial bending and torsional rigidity is provided for early fracture healing, and the low axial stiffness of the plate inhibits osteoporosis and bone weakening during later stages of bone remodeling before the plate is removed.

4,403,608

PRESSURE GAS VENTILATED PROTECTIVE SUIT AND METHOD OF OPERATING THE SUIT

Ernst Warncke, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1981, Ser. No. 248,495

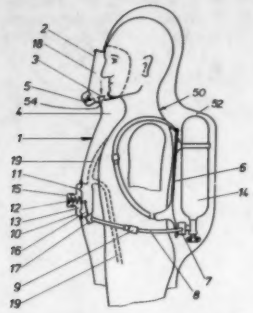
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015584

Int. Cl.³ A62B *7/04*

U.S. Cl. 128—201.28 **13 Claims**

1. A pressure gas ventilated pressure suit comprising a suit adapted to cover a person including a head portion with a face encompassing part defining a breathing space in front of the face of the wearer and a body portion defining a pressure space separate from said breathing space, a connection between said pressure space and said breathing space, check valve means in said connection permitting flow of air from said pressure space to said breathing space upon there being a predetermined pressure differential between said spaces, exhaling valve pas-

sage means connected from said breathing space to the outside of said suit, and pressure gas supply means associated with said



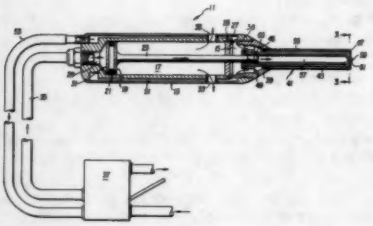
suit supplying gas under pressure to said pressure space to maintain it at a predetermined pressure.

4,403,609

VACUUM-COMPRESSION INJECTOR

Edgar C. Cohen, 4123 Vincennes Place, New Orleans, La. 70125

Filed Feb. 24, 1981, Ser. No. 237,563
Int. Cl.³ A61M *5/30*
U.S. Cl. 604—70 **10 Claims**



1. A needleless vacuum-compression injector comprising:

a continuous vacuum chamber and a pressurized gas chamber;

means for drawing a continuous vacuum in said vacuum chamber;

means for supplying pressurized gas to said pressurized gas chamber;

means for holding a medicament;

a nozzle having a passageway connected to said means for holding said medicament and for having said medicament expressed therethrough;

tissue immobilizing means including an outwardly extending surface spaced from and surrounding said nozzle wherein said nozzle substantially terminates in the plane of said surface;

said tissue immobilizing means further including an annular suction means formed in an annular region of said outwardly extending surface and spaced from and surrounding said nozzle, said annular suction means being in continuous communication with said vacuum chamber, said tissue immobilizing means, when positioned against said tissue, being operative to continuously draw said tissue toward said annular region and thereby immobilize and hold said tissue taut over said nozzle without puncturing said tissue and without substantially displacing said tissue from its initial condition; and,

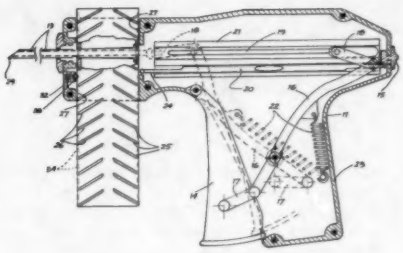
means adapted to express said medicament through said passageway and into said tissue upon application of said pressurized gas to said pressurized gas chamber.

4,403,610

GUN TO IMPLANT PELLETS IN ANIMALS

Robert H. Lodge, Wheeler Heights; Ian R. Phillips, Killara, and Mervyn F. Reynolds, Balgowlah, all of Australia, assignors to N.J. Phillips Pty. Limited, New South Wales, Australia

Filed Jun. 15, 1981, Ser. No. 273,551
Claims priority, application Australia, Jun. 19, 1980, PE4105
Int. Cl.³ A61M *5/18*
U.S. Cl. 604—61 **5 Claims**



1. A gun adapted to dispense pellets, said gun comprising a magazine formed with a plurality of passages within which the pellets are located, a plurality of projections on said magazine arranged in a predetermined relationship with respect to said passages, a gun body, a trigger movably supported by the body so as to be movable by an operator from a rest position to an actuated position, a first lever coupled adjacent one of its ends to said trigger, said lever being pivotally mounted intermediate its ends, an ejector rod adapted to be moved between a first and a second position, said ejector rod being coupled to the other end of said first lever so that upon said trigger being moved to said actuated position, said lever is caused to move from said first to said second position, guide means slidably engaging said ejector rod to cause it to move along a predetermined generally linear path, magazine support means adapted to receive said magazine so that a passage thereof is located at a predetermined position located on said path, said ejector rod, when moved from said first to said second position, being caused to move through one of said passages located at said predetermined position so as to eject a pellet located therein from within the gun, an indexing rod coupled to said other end of said lever, guide means slidably engaging said indexing rod so as to restrict the indexing rod to move along a generally linear further path between a retracted position when said trigger is in said rest position and an extended position when said trigger is in said actuated position, said further path being positioned so as to intersect projections so that upon engagement of said indexing rod with said projections said magazine is caused to move to locate a different one of said passages at said predetermined position, and wherein said indexing rod causes movement of said magazine upon movement of said indexing rod from said extended position to said retracted position.

4,403,611

SINUS EVACUATOR APPARATUS

Gerald J. Babbitt, 2424 N. Custis Rd., Arlington, Va. 22201, and Ahmet Kasap, 3306 Wyndale Ct., Woodbridge, Va. 22192

Filed Jul. 17, 1980, Ser. No. 169,684
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—73 **17 Claims**

1. A portable, flushable evacuator apparatus for aspiration of material from sinus cavities, said apparatus comprising:

(a) housing means including therein a vacuum producing

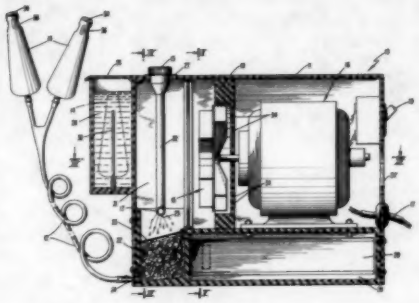
portion a mucus collection portion fixedly juxtaposed to one another and a means for flushing the mucus collecting portion with a cleansing fluid medium,

(b) propeller means rotatably mounted to a drive motor in the vacuum producing portion,

(c) catheter means connected to the mucus collection portion and being effective for insertion into a nasal opening,

(d) said propeller means being effective to produce only a suction to draw through the catheter means when said catheter means is inserted into a nasal opening,

(e) said propeller means being effective to produce an amount of suction sufficient to withdraw mucus material from the sinus cavities without causing irritation of the soft nasal tissues,



(f) said mucus collection portion having a mucus collecting compartment and a suction pervious barrier means that separates the mucus collection compartment from the vacuum producing portion and is flushable with the cleansing fluid medium to remove any mucus collected therein

(g) said barrier being effective to allow suction to be drawn through the catheter means while preventing mucus from entering the vacuum producing portion, and

(h) said flushing means being closable while said propeller means is producing a suction in said mucus collecting portion.

4,403,612

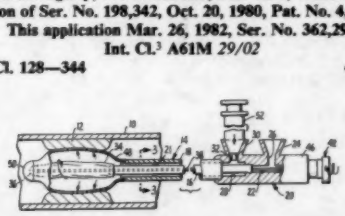
DILATATION METHOD

Thomas J. Fogarty, 770 Welch Rd., Palo Alto, Calif. 94304

Division of Ser. No. 198,342, Oct. 20, 1980, Pat. No. 4,338,942. This application Mar. 26, 1982, Ser. No. 362,295

Int. Cl.³ A61M *29/02*

U.S. Cl. 128—344 **4 Claims**



1. A method for inserting an inflatable balloon into a partially occluded section of a blood vessel and for dilating said section comprising axially twisting the balloon to reduce its diameter for passage along said vessel and into said partially occluded section, moving said balloon along said vessel while maintaining its axially twisted condition to emplace it in said section, moving said occluded section away from said balloon so that said section is not in pressing relationship with respect to said balloon and holding said section in such position while axially untwisting said balloon to an untwisted condition, and inflating said balloon to dilate said section.

4,403,613

PACIFIER

Richard L. Panicci, Hanover, Mass., assignor to Kiddie Products, Inc., Avon, Mass.

Filed Mar. 9, 1981, Ser. No. 241,589

Int. Cl.³ A61J *17/00*

U.S. Cl. 128—360 **3 Claims**

1. A pacifier for an infant comprising:

a generally circular shield having an edge which is rounded and smooth,

said edge having a top which is disposed near the infant's nose when said pacifier is in place and a bottom which is disposed opposite said top,

said shield having a front side and a rear side, said front side being disposed adjacent to the infant's face when said pacifier is in place,

said shield having a nipple attached to and extending from said front side,

said shield having a substantially concave cross-section on said front side towards the infant's face from said top above said nipple when said pacifier is in place to the approximate midpoint between said nipple and said bottom, and a substantially convex cross-section on said front side towards the infant's face from the approximate midpoint between said nipple and said bottom to said bottom below said nipple, and

a handle means attached to and extending from said rear side of said shield.

4,403,614

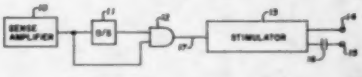
IMPLANTABLE CARDIOVERTER

William R. Engle, Blaine, Minn.; E. Neil Moore, Jr., Wallingford; Joseph F. Spear, Jr., Philadelphia, both of Pa., and Ronald H. Rockland, Parsippany, N.J., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 58,847, Jul. 19, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 239,007

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 D **18 Claims**



1. A body implantable ventricular cardioverter which comprises:

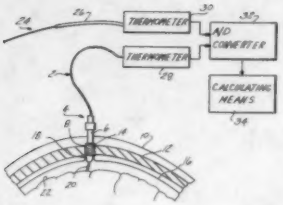
means for detecting the onset of a malignant ventricular tachyarrhythmia;

means responsive to the detecting means for providing a cardioverting signal, said cardioverting signal having an energy level that is high relative to a typical pacing threshold of 50 microjoules and below 45 joules that is typically necessary for defibrillation.

4,403,615
THERMAL METHOD FOR MEASURING BLOOD PERFUSION

Paul J. Hoehner, 1209 E. Belvedere Ave., Baltimore, Md. 21239

Filed Dec. 14, 1981, Ser. No. 330,568
Int. Cl.³ A61B 5/08
U.S. Cl. 128—692 4 Claims

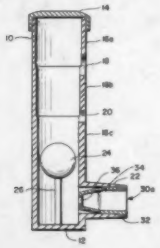


1. A method for measuring blood perfusion comprising the steps of:
a. emplacing one temperature sensing means in contact with an organ of the patient;
b. inserting another temperature sensing means in a central artery of the patient;
c. injecting a fluid having a temperature substantially lower than the temperature of the blood of the patient into a vein of the patient;
d. recording the thermal temperature gradient of the blood perfusion through the portion of the organ in the patient's body;
e. recording the thermal temperature gradient of the blood flow through the artery of the patient;
f. calculating the area under the curve determined by the thermal temperature gradient of the blood perfusion through the portion of organ of the patient;
g. calculating the area under the curve determined by the thermal temperature gradient of the arterial blood flow; and
h. determining the difference between the two calculated areas to provide an indication of the rate of blood perfusion through the portion of the organ in the patient's body.

4,403,616
EXPIRATORY BREATHING EXERCISE DEVICE

George E. King, Barrington, R.I., assignor to K-Med, Inc., Flemington, N.J.

Filed Jun. 9, 1981, Ser. No. 271,984
Int. Cl.³ A63B 23/00
U.S. Cl. 128—725 3 Claims

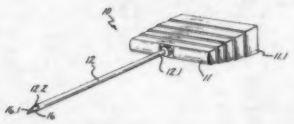


1. An expiratory breathing exercise device comprising:
a substantially enclosed elongate air flow column disposed longitudinally in a generally vertical orientation, said air flow column having a horizontal cross-sectional interior dimension which increases in size upwardly in graduated increments over the length of said column;
an air inlet located in said column adjacent the bottom thereof;
connecting means for fluidly connecting said air inlet to the mouth of the user so that air expired from the user enters said column through said air inlet;
at least one air outlet located in said column above said air inlet through which expired air entering said air inlet is exhausted from said column;
an air flotation element movably disposed in said column so as to be lifted in said column by the blowing of air into said column with sufficient force by the user, said air flotation element being sized so as to fit relatively closely within said air flow column such that due to the increase in cross-sectional dimension of said column in increments, a given exhalation effort of the user causes said air flotation element to stabilize at a position in said air flow column relative to the cross-sectional dimension which corresponds to a given exhalation rate of air flow through said column and at a position where said air flotation element is visible to the user through said at least one air outlet; and
restriction means for altering the resistance to air flow through said connecting means and into said column whereby the effort expended by the user in the raising of said air flotation element to a predetermined position in said column is increased as the resistance to air flow increases,
said restriction means comprising a plurality of plugs having differing sized orifices, said plugs being interchangably insertable into said air inlet,
the interior of said plugs being funnel shaped in the direction of flow so that a smooth non-turbulent flow of air enters said column.

4,403,617
BIOPSY NEEDLE

Carl W. Tretinyak, Rochester, Minn., assignor to Waters Instruments, Inc., Rochester, Minn.

Filed Sep. 8, 1981, Ser. No. 299,981
Int. Cl.³ A61B 10/00
U.S. Cl. 128—754 9 Claims



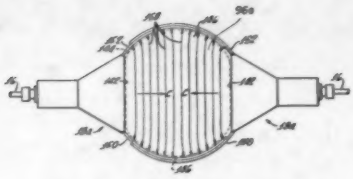
1. In a biopsy needle comprising a hollow cannula with a sharpened distal end and a stylet coaxially received in the cannula and having a sharpened solid distal end protruding from the distal end of the cannula, the improvement wherein the sharpened distal end of the stylet includes an oblique, concave face forming a trough extending at an acute angle to, and intersecting, the axis of the stylet.

4,403,618

APPARATUS FOR ELECTROMAGNETIC RADIATION OF LIVING TISSUE AND THE LIKE

Paul F. Turner, North Salt Lake, and Om P. Gandhi, Holladay, both of Utah, assignors to BSD Medical Inc., Salt Lake City, Utah

Division of Ser. No. 2,584, Jan. 11, 1979, Pat. No. 4,271,848.
This application Apr. 21, 1981, Ser. No. 256,019
Int. Cl.³ A61N *1/40*
U.S. Cl. 128—804 **1 Claim**



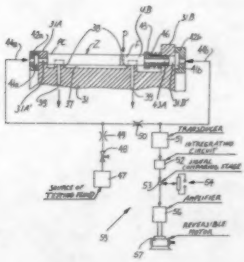
1. Electromagnetic radiation apparatus, which comprises:
(a) a plurality of applicators configured for irradiating living tissue and tissue simulating matter, each of said applicators having a radiation emitting surface; and,
(b) conductive means fixed to each of the applicators adjacent said emitting surface, for providing radiation emitting extensions, said conductive means including deformable first and second flaps adapted to be positioned at least partially around the tissue or tissue simulating matter in substantial overlapping relationship with at least one of the flaps of adjacent ones of the applicators to thereby enclose portions of the tissue or tissue simulating matter within a cavity defined by the radiation emitting surfaces and overlapping flaps.

4,403,619

METHOD AND APPARATUS FOR INFLUENCING THE PERMEABILITY OF WRAPPERS OF FILTER CIGARETTES OR THE LIKE

Rolf Dahlgrün, La Celle-St. Cloud, France, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 81,314, Oct. 3, 1979, Pat. No. 4,282,889.
This application Apr. 20, 1981, Ser. No. 255,460
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845342
The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.
Int. Cl.³ A24C *5/00*
U.S. Cl. 131—280 **24 Claims**



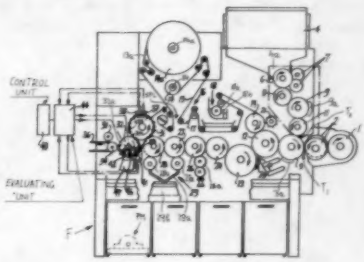
1. A method of influencing the permeability of foraminous wrapping material for rod-shaped commodities which form part of or constitute smokers' products, comprising the steps of coating at least a portion of one side of the wrapping material with adhesive; converting the thus coated wrapping material into open-ended tubular wrappers of rod-shaped commodities; testing the air permeability of the wrappers and generating first signals denoting the measured air permeability of the wrappers; comparing said first signals with a second signal denoting the desired air permeability and generating third signals denoting the difference if any, between said first signals and second signal; and varying the quantity of adhesive which is applied per unit area of said one side of the wrapping material as a function of said third signals to thereby vary the permeability of the wrappers.

4,403,620

METHOD AND APPARATUS FOR MONITORING THE FUNCTIONING OF TESTING DEVICES IN MACHINES FOR THE PRODUCTION AND/OR PROCESSING OF SMOKERS' PRODUCTS

Horst D. Joseph, Hamburg, and Friedo Koch, Wohltorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,327
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026255
Int. Cl.³ A24C *5/00*
U.S. Cl. 131—280 **36 Claims**



1. A method of manipulating rod-shaped articles which constitute or form part of smokers' products, comprising the steps of conveying the articles in a predetermined direction and along a predetermined path having a plurality of first sections as well as a second and a third section both located downstream of said first sections; subjecting successive articles to a test in each of said first sections, including respectively generating at each of said first sections signals of first and second types when the articles being tested are respectively defective and satisfactory; normally transporting signals of said first type from each of said first sections to said second section and utilizing such signals of the first type for segregation of the respective articles from said path at said second section; optionally transporting signals of at least one of said first and second types from a selected first section to said third section; and utilizing signals of said one type for removal of the respective articles from said path at said third section.

4,403,621

HAIR-WAVING ROD

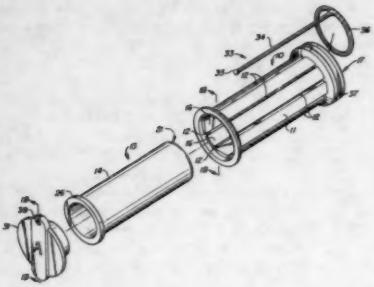
Norman P. Paradise, 13991 Pike Rd., Saratoga, Calif. 95070

Filed Apr. 19, 1982, Ser. No. 369,436
Int. Cl.³ A45D *2/00*
U.S. Cl. 132—40 **11 Claims**

1. An implement for use in giving a permanent wave to hair comprising:
first means defining an elongate rod member of generally cylindrical shape for wrapping strands of hair thereabout;
second means defining a plurality of slender axially extending passageways within said rod member, said passage-

ways being angularly spaced about the periphery of said rod member, and each said passageway being in flow communication along its length with the exterior of said rod member; and

third means defining a diverting chamber at an end of said rod member in flow communication with said plurality of



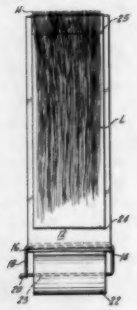
passageways, said chamber having an inlet for receiving hair treatment solution and being structured for diverting solution introduced through said inlet to each said passageway in roughly equal flow whereby solution flowing along said passageways passes to strands of hair wrapped around said rod member.

4,403,622

DEVICE FOR USE IN STRAIGHTENING OR RELAXING HAIR, AND METHOD THEREFOR

Michael L. Stahl, 7700 SW. 135th Ave., Miami, Fla. 33183

Filed Jul. 28, 1982, Ser. No. 402,790
Int. Cl.³ A45D *2/18*
U.S. Cl. 132—43 R **9 Claims**



1. A device for use in straightening and relaxing hair comprising a generally flat base member or board of a predetermined length and width, including

a first and second end portions, and opposed longitudinal side edge portions,

the first end portion to rest next to the head of hair to be treated; and

the second end portion, having along the width of said board

a cutting edge, and

a means for holding a generally rectangular shaped wire member; said wire member

having one length approximately the same as the width of said base member, and with said length of said wire member being held along said width of said base member;

having a second length which serves as a means for holding a roll of paper; and along one width of said wire member

having a fastener capable of being open and closed for inserting or removing said roll of paper;

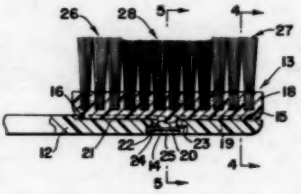
whereby said means for holding said wire member can act as a hinge for lowering or raising the assembly of wire member and roll of paper to bring a strip of paper, unrolled from a roll, in contact with said cutting edge of said base member in order to cut a length of paper having a desired length.

4,403,623

COMBINED TOOTHBRUSH AND GUM MASSAGE DEVICE

Reuben Mark, Greenwich, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,877
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 R **7 Claims**



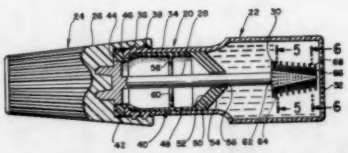
1. A combined toothbrush and gum massage assembly comprising an elongated handle member, a bristle carrying head member pivotally mounted on said handle member near one end for movement between a first operating position in substantial alignment with the length of such handle member and a second operating position substantially at right angles to the length of said handle member, and resiliently biasing said head member toward said handle member to maintain locking engagement between said members in each of said two positions, one of said members having a pivot stem rotatably mounted on the other member, and cooperating rib and groove means capable of resisting displacement of said head member from either of said locked positions during normal toothbrushing and/or gum massaging operations, but being readily responsive to torque applied by a user to turn the head member from one position to another being provided on said members to interlock at said positions.

4,403,624

COSMETIC APPLICATOR AND CONTAINER SYSTEM

Robin M. Montgomery, 3819 Hayvenhurst Ave., Encino, Calif. 91436

Filed Sep. 25, 1981, Ser. No. 305,697
Int. Cl.³ A45D *40/26*; A46B *11/00*
U.S. Cl. 132—88.7 **6 Claims**



1. In a cosmetic system for use in the application of mascara to eye lashes,

a container for holding mascara and having an opening;

an applicator including a handle portion, a rod portion having a longitudinal axis and an applicator brush portion;

said applicator brush portion and said rod being removably inserted in said container through said opening to immerse said applicator brush portion in mascara;

wiper means mounted on said container and extending therein into from said opening for wiping said applicator as it is withdrawn from said container;

the improvement comprising:

said applicator brush portion includes an annular base portion and a plurality of spines projecting outwardly from said base, said spines being resilient, of varying lengths, independent one from the other and each spine being circular in cross section;

said wiper means includes a cylindrical portion interfitted within said container having a flange portion at one end for engagement with the opening of said container and a frusto-conical shaped end portion of a resilient elastic and flexible material converging inwardly of said container forming an opposite end wall and an opening extending therethrough forming a first wiper portion therewith and intermediate said flange portion of said frusto-conical shaped end portion a wall of a resilient elastic and flexible material and an opening extending therethrough forming a second wiper portion therewith; and

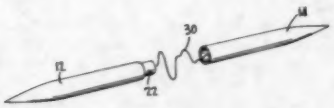
each of said openings in said wiper means being of a diameter to stretchable engage said applicator brush portion as said applicator is withdrawn from said container and one of said openings is of a diameter to also circumferentially engage said rod whereby excessive mascara on said brush portion and said rod is removed.

4,403,625

DISPOSABLE BUCCAL HYGENIC DEVICE

James B. Sanders, 1510 Beverwil Dr., Los Angeles, Calif. 90035, and Don Kobashigawa, 3633 W. Olive Ave., Burbank, Calif. 91505

Filed Oct. 23, 1981, Ser. No. 314,431
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 **20 Claims**



1. An inexpensive, disposable buccal hygenic device comprising

a strand of dental floss,

an elongated, generally cylindrical body having one end thereof narrowed sufficiently to function as a toothpick, the body being generally separable into two end members, a separate end of the strand of dental floss being affixed to each proximal end of the two end members so that when the members are separated, the members may serve as handles to assist in proper manipulation of the dental floss about a user's teeth, and

means for isolating the dental floss from the atmosphere prior to the members being separated from each other to insure hygenic conditions.

4,403,626

VALVE ASSEMBLY

Herman L. Paul, Jr., Lebanon, Pa., assignor to Continental Disc Corporation, Kansas City, Mo.

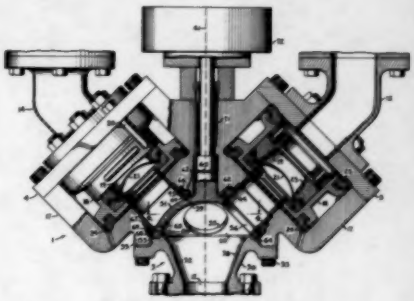
Filed May 18, 1981, Ser. No. 264,355
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **15 Claims**

11. In a valve arrangement, the combination comprising:

(a) a valve housing having a first outlet and a second outlet in angularly spaced relation about a first axis of said housing and having an inlet, said housing including an inner surface which is a surface of revolution of a shape about said first axis;

(b) a flow directing member having a first aperture and a second aperture therethrough, said first and second apertures being in angularly spaced relation about a second axis associated with said member and in flow communication with said inlet, said flow directing member having an outer surface similar to said inner surface of said housing;

(c) said flow directing member being rotatably mounted coaxially within said housing for sealing between the outer surface of said flow directing member with the inner



surface of said housing, said flow directing member being rotatable to selectively position one of said first and second apertures in alignment with a respective one of said first and second outlets to provide full communication therethrough and to completely seal the other of said outlets; and

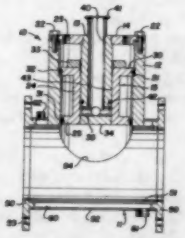
(d) said outlets and said apertures being sized and positioned such that said second aperture is partially aligned with said second outlet when said first aperture is partially aligned with said first outlet whereby a flow path is always provided between said inlet and at least one of said outlets.

4,403,627

BUFFER VALVE

Gerald R. Bradley, Rte. 1, Box 484A, Red Oak, Tex. 75154

Filed Jul. 22, 1980, Ser. No. 171,119
Int. Cl.³ F16K *17/12, 31/12*
U.S. Cl. 137—508 **10 Claims**



1. A buffer valve for a fluid flow system comprising: a cylindrical valve housing having a first open end for communication with said fluid flow system and a second opposite closed end; a central discharge tube secured to said second end of said valve housing, said discharge tube and said valve housing having coincident longitudinal axes, said discharge tube and the inner wall of said valve housing defining an annular housing chamber, said discharge tube having a blind bore closed at a first inward end and having an opening along a second oppo-

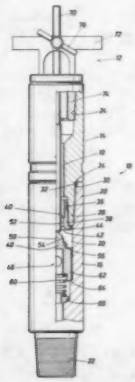
site end portion outward of said valve housing and lateral discharge ports along an inward end portion opening into said blind bore; an annular piston in said annular housing chamber around said discharge tube, said piston having an annular area facing said first open end of said housing and adapted to move between an inward end position covering said discharge ports in said discharge tube and an outward end position uncovering said discharge ports responsive to pressure in said fluid flow system admitted through said first open end; and means for biasing said annular piston toward said inward end position.

4,403,628

INSIDE BLOWOUT PREVENTER

Amrik S. Nijjar, Houston, Tex., assignor to Wood George & Company, Houston, Tex.

Filed Jan. 21, 1981, Ser. No. 226,726
Int. Cl.³ F16K 15/02
U.S. Cl. 137—515.5 3 Claims



1. An inside blowout preventer, comprising

an upper body having a center passage therethrough, said upper body including an externally lower pin end including a center passage seat pocket with a downwardly and outwardly tapered side surface terminating in a shoulder at its lower end,

a lower body having a center passage therethrough, said lower body including an internally threaded upper box end for threaded attachment to said pin end of said upper body,

a valve seat having an external side surface upwardly and inwardly tapering so as to mate with said seat pocket,

an upwardly biased dart valve having a lesser taper at the valve seating surface than said valve seat surface mating with said seat pocket operating in conjunction with said seat so that normal downwardly circulated fluid through said seat opens said dart valve, excessive backpressure against said dart valve presenting such opening from occurring,

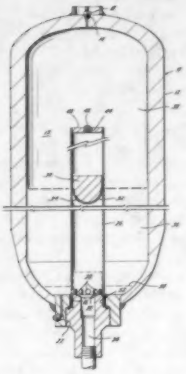
said seat having an outwardly turned flange for upward contacting of the shoulder at the terminating end of said seat pocket to prevent excessive back pressure applied to said dart valve from such hard upward wedging of said seat in said seat pocket so as to outwardly distort said pin end.

4,403,629

LIQUID-GAS ACCUMULATOR AND FLOAT VALVE

Douwe de Vries, 802 Piney Point, Houston, Tex. 77024

Filed Jan. 29, 1982, Ser. No. 344,129
Int. Cl.³ F16L 55/04
U.S. Cl. 138—31 1 Claim



1. A liquid-gas accumulator comprising,

a housing having a top port and a bottom port,

a gas charging valve positioned in the top port for the admission of high pressure gas,

a liquid inlet-outlet valve seat threadedly positioned in the bottom port for insertion and removal through the bottom port,

a riser tube coaxially and threadedly secured about the valve seat and extending upwardly in the housing, said riser tube being smaller in cross section than the bottom port for insertion and removal from the housing through the bottom port,

said tube being closed except for a plurality of fluid openings adjacent the lower end of the tube positioned above the valve seat, and an orifice at the top of the tube, said orifice sized to allow gas to enter the tube at a rate which keeps the liquid level in the tube equal to the liquid level in the housing, and

a solid float floating on the liquid in the tube having a valve element for coacting with and seating on the valve seat when liquid is expelled from the accumulator.

4,403,630

APPARATUS FOR TENSIONING THE WARP THREAD SHEET OF A LOOM

Miguel A. Stacher, Arbon, Switzerland, assignor to Aktiengesellschaft Adolf Saurer, Arbon, Switzerland

Filed Jul. 28, 1981, Ser. No. 287,632
Claims priority, application Switzerland, Aug. 26, 1980, 6417/80
Int. Cl.³ D03D 49/06, 39/22
U.S. Cl. 139—102 5 Claims

1. An apparatus for tensioning a warp thread sheet of a weaving machine, particularly the pile warp of a Terry weaving machine, comprising:

a deflection beam which yields under the action of the alternating tension of warp threads withdrawn from a warp beam;

a support beam serving for supporting the warp threads;

said support beam having opposed ends;

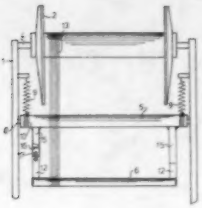
bending springs effective in a direction of deflection of the warp threads travelling over said deflection beam;

said deflection beam being supported at both opposed ends of said support beam by means of said bending springs;

means mounting each of said bending springs rigidly for rotation with said support beam;

spring means provided for said support beam;

said support beam being subjected to the tension of said spring means which counteract a rotational action of the warp threads exerted upon said support beam;



said mounting means including a respective bending-resistant adjustable support plate which is adjustable in longitudinal direction thereof provided for each of the bending springs; and

said bending springs being supported upon each related one of said bending-resistant adjustable support plates in order to be able to change the effective bending length of said bending springs.

4,403,631

FLEXIBLE PIPE

Gasan M. B. O. Abdullaev, ulitsa Saraikina, 27, blok 2, kv. 18; Faramaz G. O. Maxudov, ulitsa Gadzhibekova, 33/35, kv. 29; Dzhangir A. K. O. Kasimov, ulitsa Gadzhibekova, 38, kv. 39; Bakhtiyar M. R. O. Mamedov, prospekt Neftyanikov, 87, kv. 15; Gabil G. Aliev, ulitsa Gadzhieva, 42, blok 1, kv. 1; Yashar A. O. Gadzhiev, 4 mikroraion, ulitsa 7-ya Binagadinskaya, 9, kv. 9; Rovshan I. O. Shakhmamedov, ulitsa Gubanova, 10, kv. 8, all of Baku, and Alexei A. Iljushin, Chistyo prudy, 9, kv. 44, Moscow, all of U.S.S.R.

PCT No. PCT/SU80/00153, § 371 Date May 12, 1981, § 102(e) Date May 6, 1981, PCT Pub. No. WO81/00746, PCT Pub. Date Mar. 19, 1981

PCT Filed Sep. 1, 1980, Ser. No. 261,206

Int. Cl.³ F16L *9/16*

U.S. Cl. 138—130 **8 Claims**

1. In a flexible pipe comprising an inner supporting pipe made from an elastic material; a power frame formed by a shaped strip having a Z-shaped cross-sectional profile with two stepwise conjugated flanges, the strip being wound in a spiral fashion onto the supporting pipe such that the upper flange of each turn is disposed over the lower flange of the adjacent turn, an interlayer formed of an elastic material and superimposed onto the power frame, at least one pair of reinforcing layers including an upper and a lower reinforcing layer, said reinforcing layers being formed by groups of power filaments, said filaments being parallel to one another and wound in opposed directions onto said interlayer, and an external protective shell formed of an elastic material, the improvement comprising, each of said flanges is of a quadrangular cross-section and is of a height equal to one half of the height of the profile of the strip so that the upper flange of each turn rests directly on the lower flange of the adjacent turn, and the ends of the upper flanges as well as the ends of the lower flanges are aligned, the power filaments of each reinforcing layer being wound at angles of from about 0° to 20° to the axis of the pipe.

4,403,632

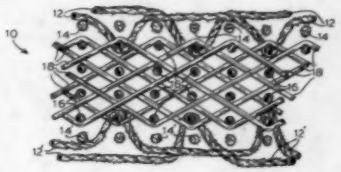
CORRUGATOR BELT WITH HIGH AIR PERMEABILITY

Eric R. Romanski, Delmar, and Michael J. Josef, Clifton Park, both of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Mar. 19, 1981, Ser. No. 245,360

Int. Cl.³ D03D *11/00*; D21F *11/12*

U.S. Cl. 139—383 A **10 Claims**



1. A multi-layer, flat woven, high permeability, composite fabric, useful in forming the body of an endless corrugator machine belt and having an air permeability of at least 10 and up to 2000 cubic feet per minute which comprises;

a multi-layer base of interwoven machine direction and cross-machine direction synthetic polymeric resin monofilament yarns;

said base being sandwiched between surface layers, at least one of which is of interwoven, soft textile yarns;

said layers of soft textile yarns being secured to the base by an interweaving of the soft textile yarns with the base yarns.

4,403,633

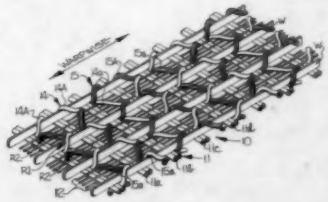
WOVEN PILE FABRIC

Paul A. Czelusniak, Jr., Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed Jun. 11, 1981, Ser. No. 272,505

Int. Cl.³ D03D *27/06*

U.S. Cl. 139—402 **9 Claims**



1. A woven pile fabric formed from weft yarns, groups of warp yarns, and two sets of pile yarns forming warpwise extending rows of pile tufts, each warpwise extending row of pile tufts being formed of pile yarns from both sets of pile yarns with the tufts formed of the two sets being arranged in a predetermined alternating sequence in each row warpwise of the fabric, and warpwise extending rows of pile yarn floats hidden

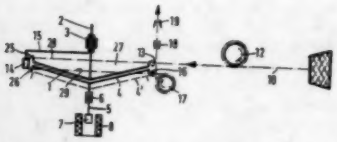
from view extending between said warpwise extending rows of pile tufts and across and over groups of warp yarns positioned therebetween, said rows of pile yarn floats being formed of pile yarns from both sets of pile yarns with the floats formed of the two sets being arranged in a predetermined alternating sequence warpwise of the fabric but in out-of-phase relation to said alternating sequence of arrangement of the tufts formed of the two sets of pile yarns forming the rows of pile tufts whereby pile yarns from both sets selectively and alternately form the pile tufts of the fabric to provide enhanced pattern effects.

4,403,634

WEFT YARN STORAGE DEVICE FOR WEAVING MACHINES

Frantisek Jankovsky, Winterthur, and Paul Lincke, Zell, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 17, 1981, Ser. No. 244,834
Claims priority, application Switzerland, Apr. 1, 1980, 2555/80; Jan. 7, 1981, 60/81
Int. Cl.³ D03D 47/36
U.S. Cl. 139—452 9 Claims



1. A weft yarn storage device for a weaving machine comprising

a pair of storage drums;

a yarn advancer having a yarn guide disposed for rotation about said drums to lay one arm of a yarn loop on one of said drums and another arm of the yarn loop on the other of said drums; and

actuating means for causing a relative position of said yarn guide and at least one of said drums for releasing the yarn loop from said drums for insertion into a shed.

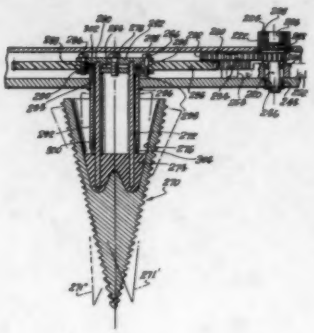
4,403,635

POWERED WOOD SPLITTER WITH MULTIPLE WORK HEADS

Floyd L. York, 33575 Bonnie B Rd., North Fork, Calif. 93643

Filed May 19, 1980, Ser. No. 151,306
Int. Cl.³ B27L 7/00
U.S. Cl. 144—366 10 Claims

1. The method of splitting a piece of wood into a plurality of pieces with a portable powered hand-held device having at least two rotating output shafts which comprises: (1) attaching a conically-shaped, externally grooved member to each shaft in such manner that said conical members can be rotatably operable on an axes other than that of the rotating output shafts; (2) applying said conical members to said piece of wood in such manner that each conical member is in a different plane than the other in relationship to the various grains in the wood; and



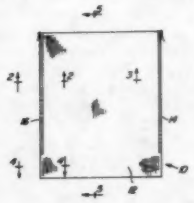
(3) moving said conical members into the piece of wood to spread the segments of wood from one another.

4,403,636

LAUNDRY BAG

Robin D. Lopez, 6954 N. Sheridan Rd., Chicago, Ill. 60626

Filed Jul. 6, 1981, Ser. No. 280,981
Int. Cl.³ A45C 3/00
U.S. Cl. 150—1 2 Claims



1. A laundry bag comprising an elongated, flat heavy, fabric material folded in half upon itself, the lower portion of the side edges partially sewn together, means on both side edges above the portion sewn together and extending to the top of the bag for opening and closing said side edges whereby the bag may be substantially laid flat.

4,403,637

REINFORCED FLEXIBLE CONTAINER

Maria D. Rivelles Sabater, 16, Font de Mora St., Puzol (Valencia); Maria T. Alcala Perales, 8, Doctor Sumsi St., Valencia; Carmen Manes Uso, 11, San Vicente St., Tabernes Blanques (Valencia), and Maria A. Calabuig Sanchis, 5, Alcalde Reig St., Valencia, all of Spain

Filed Sep. 21, 1981, Ser. No. 304,341
Int. Cl.³ B65D 33/02
U.S. Cl. 150—12 4 Claims

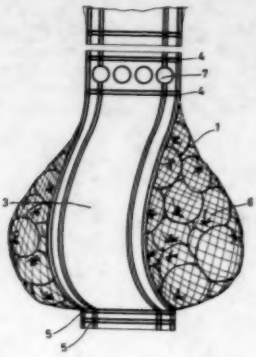
1. A container comprising:

a mesh bag having opposite ends;

first and second bands of flexible material having opposite ends;

said bands being positioned on opposite sides of said bag, with said opposite ends of said bands covering and being joined to respective said opposite ends of said bag, and

with said bag and said bands being free of any connection between said opposite ends; and



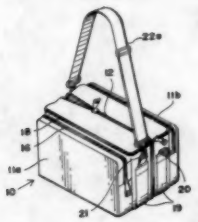
one said joined end of said bag and bands having formed therethrough at least one carrying opening.

4,403,638

COMBINATION CAMERA BAG

Frank Baum, 1030 E. 30th St., Hialeah, Fla. 33013

Filed Apr. 21, 1982, Ser. No. 370,304
Int. Cl.³ A45C *11/38*
U.S. Cl. 150—52 J **4 Claims**



1. A camera bag assembly comprising, in combination, a first bag portion of flexible material, a second bag portion of flexible material, said second bag portion being of the same size as and a mirror image of said first bag portion, slide fastener means for securing one side of said first bag portion against the corresponding side of said other bag portion, a pair of substantially rectangular camera bag insert members removably receivable, one each, within said first and second bag portions, said bag insert members each comprising peripheral sidewalls, end walls, a bottom wall, and a top wall, all fabricated of a soft cushioning material serving as padding for contained articles, a plurality of interior partition wall members sub-dividing said bag insert members into a plurality of insert compartments, said partition walls also being fabricated of a soft, pliable and flexible material serving as padding for contained articles.

4,403,639

STUD ARRANGEMENT ON CHAINS FOR MOTOR VEHICLES, AND A METHOD OF PRODUCING SUCH CHAINS

Bjarne Holte, N-3789 Kjollbroen, Norway

Filed Sep. 11, 1981, Ser. No. 301,258
Claims priority, application Norway, Oct. 2, 1980, 802810
Int. Cl.³ B60C *27/00*; B21L *17/00*; B23K *11/04*
U.S. Cl. 152—245 **2 Claims**

1. A casehardened studded chain for motor vehicles comprising a plurality of casehardened chain links each of which has at least one stud extending outwardly therefrom, each of said studs consisting of a steel body which is permanently welded to a casehardened chain link and provided with a centrally disposed hard metal pin, the hard metal pin being located within the steel body such that the sides of said pin projecting away from said chain link and the end of said pin remote from said chain link are covered by steel material of said body, the covering portions of said steel material having a thickness which is at least equal to the casehardening penetration depth of said casehardened chain link.

2. A method of producing studded chains of the type comprising a plurality of casehardened chain links each of which has at least one stud extending outwardly therefrom and wherein each of the studs consists of a steel body which is permanently welded to a chain link and is provided with a centrally disposed hard metal pin, said method comprising the steps of cutting an inwardly converging blind hole into one end of the steel body, forcing into said blind hole a hard metal pin of a shape corresponding to the conical hole, the pin being shorter than the blind hole so that a skirt is formed adjacent the open end of said hole, beveling the edges of the skirt, joining the steel body with the hard metal pin therein to the chain link at the beveled end of said body by resistance welding in a machine for welding studs onto chain links, the bodyd with the pin therein gradually being moved toward the chain link as the beveled end melts and flows radially outwards, and thereafter casehardening the chain link with the stud joined thereto, the portions of said steel body which cover said hard metal pin being operative to protect said pin from damage during said casehardening step and having a thickness which is at least equal to the casehardening penetration depth of said casehardened chain link.

4,403,640

TIRE MOUNTING COMBINATION TOOL

Richard E. Schifferly, 9717 Waterville-Neapolis Rd., Waterville, Ohio 43566

Continuation-in-part of Ser. No. 104,741, Dec. 18, 1979. This application Jul. 13, 1981, Ser. No. 282,728
Int. Cl.³ B60C *25/04*
U.S. Cl. 157—1.3 **3 Claims**

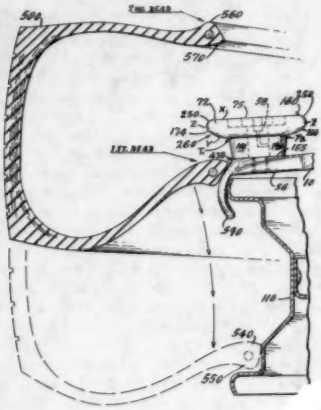
1. A semiautomatically operated tire mounting tool for mounting a tire comprising:

(a) a longitudinally extending base arm member of longitudinal extent with an upper and a lower surface, said arm member having a longitudinal central axis and said arm having a mounting end and a demounting end, with a fixed shaft member integrally affixed near the mounting end on the upper surface on said arm member, and wherein said mouting arm has a bend therein such that the upper surface has two portions in different surface planes that intersect one another, and wherein said arm member has a longitudinally extending opening extending over a portion

of said arm, with said opening extending completely through said arm from the upper surface to lower surface;

(b) a rotatably mounted roller affixed on the fixed shaft mounted on said arm member adjacent the mounting end thereof, and wherein the shaft on said mounting end is affixed such that the center thereof is located a distance away from the longitudinal central axis of said arm member, and wherein said roller has a longitudinally extending vertical central axis about which said roller is symmetrically formed and about which vertical axis said roller is rotatably mounted for free rotation relative to said tire mounting tool, said roller comprising:

(1) a lower portion said lower portion being shaped in the form of an inverted truncated cone with the upper part of said lower portion having an upper and lower part thereof;



(2) an upper portion with said upper portion on said roller having respectively an upper and lower surface with the lower surface of said upper portion being affixed adjacent to the upper part of said lower portion of said roller in a flush, concentric manner, and wherein said upper portion has a circumferential peripheral lip which is convex, and wherein such convex lip is defined on its external surface by two separate radii, one such generated from a center point which is on the upper surface of said upper portion and one of which is on the lower surface of said upper portion;

(c) a vertically depending positioning tong with lateral sides on the working end of said arm, which tong has a variable thickness on its extent as it extends from one side to the other of said arm member.

4,403,641

ADJUSTABLE, QUICK INSTALLATION, WINDOW COVERING DEVICE

William M. Reeder, 2666 St. Rte. 82, Aurora, Ohio 44202

Filed Aug. 26, 1981, Ser. No. 296,430

Int. Cl.³ A47G 5/02

U.S. Cl. 160—263 **5 Claims**

1. A window covering device, for use with framed windows of varying size comprising:

an elongated support rod having a slot therein for receiving an end of a piece of shade material;

a bracket for each end of said elongated support rod;

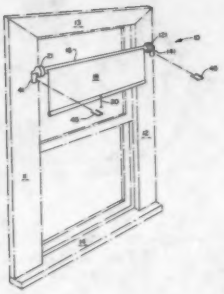
means to permit easy length adjustment of an end of said support rod;

further means for quickly attaching each bracket to a window frame for a quick, simple installation of the device with a framed window;

each bracket having a rod end support bearing therein to permit rotation of said support rod and a mounting projection extending outwardly therefrom for association with said further means;

said further means for quickly attaching each bracket to a window frame consisting of a U-shaped staple of a sufficient size to fit over said bracket mounting projection;

said means to permit length adjustment of an end of said support rod including a plurality of circumferentially spaced grooves evenly spaced from the tip end of the



slotted rod to permit portions thereof to be easily removed by breaking off during the initial sizing of the device; and

the bracket associated with the said tip end of the slotted support rod is provided with an enlarged bearing opening, and a secondary support rod portion of larger diameter along its entire length than the slotted support rod is mounted upon the tip end of the slotted support rod and supported rotatably within the enlarged bearing of said bracket.

4,403,642

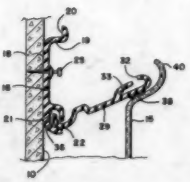
FABRIC SUPPORTING TRACK ASSEMBLY

Milton A. Morris, 21423 Stanwell St., Chatsworth, Calif. 91311

Filed Dec. 7, 1981, Ser. No. 327,766

Int. Cl.³ A47H 23/01

U.S. Cl. 160—380 **3 Claims**



1. A fabric supporting track assembly including, in combination:

(a) a first extruded track having a flat longitudinal central portion for engaging a flat marginal surface of a wall area to be covered with fabric, one longitudinal edge of said first track turning away from the wall area in a direction generally normal thereto and thence turning outwardly of the central portion in a direction generally parallel to the wall area to define a first half of a snapping clamp, the opposite longitudinal edge of the track being formed into a C-shaped channel opening away from the wall area to define a first half of a hinge;

(b) fastening means for securing said flat longitudinal central portion to said flat marginal surface of said wall area; and,

(c) a second extruded track having a flat longitudinal central

portion for positioning in opposed spaced relationship to said first mentioned flat longitudinal central portion, one longitudinal edge of said second track turning towards said wall area and thence inwardly to define a second half of said snapping clamp, said one longitudinal edge further including a U-shaped stuffing channel with the opening of the U facing the underside of said second half of said snapping clamp, the opposite longitudinal edge of said second track turning towards said wall area, thence extending outwardly of the central portion, thence being formed into a C-shaped channel opening towards the wall area to define a second half of said hinge, whereby after securement of said first extruded track to said flat marginal surface of said wall area, said second track can be hinged to the first track by interdigitating the second half of said hinge with the first half of said hinge, said second track then being swingable about the hinge away from the wall area to facilitate insertion of the selvage of fabric material over said one longitudinal edge of said second track into said stuffing channel, subsequent swinging of the second track into opposing relationship to the first track a distance such that said second half of said snapping clamp snaps over said first half of said snapping clamp, to secure the selvage between the second and first snapping clamps, simultaneously stretching and locking the fabric to the first track along the entire one longitudinal edge of the first track said stretching occurring when the one edge of said fabric opposite said selvage is held fast.

4,403,643

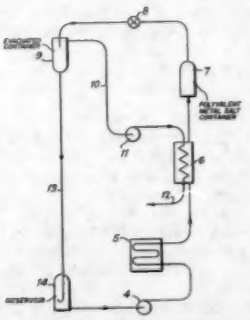
METHOD AND APPARATUS FOR ACCUMULATING, STORING AND RELEASING THERMAL ENERGY

Wallace L. Minto, Sarasota, Fla., assignor to Sunpower Systems Inc., Sarasota, Fla.

Division of Ser. No. 949,593, Oct. 10, 1978, abandoned. This application Jun. 22, 1981, Ser. No. 276,431

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **7 Claims**



1. The method of handling thermal energy comprising the steps of heating a heat storage medium including a slurry of an at least partially hydrated heat storage water soluble polyvalent metal salt material having relatively hydrated and dehydrated stages dispersed in a water immiscible liquid unreactive with said salt material with thermal energy derived from a source thereof to extract water from and convert said salt material to a water impoverished state, separating from said slurry the water released from said salt material, thereafter adding water to said water impoverished material to effect at least the partial rehydration thereof with the evolution of heat and applying said evolved heat to a heat consuming process.

4,403,644

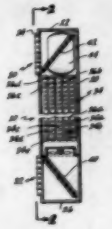
METHOD AND APPARATUS FOR ROOM TEMPERATURE STABILIZATION

Raymond T. Hebert, P.O. Box 134, Saratoga, Calif. 95071

Filed Sep. 20, 1982, Ser. No. 419,728

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **8 Claims**



1. Method for the efficient storage of heat from a fluid body comprising the steps of selecting a PCM body with a fusion transition of a predetermined temperature relative to temperature of said fluid body, moving the fluid stream through the PCM body in thermal exchange relation therewith to establish a fluid stream inlet and outlet with said body, removing heat from the outlet fluid stream and adding the removed heat to the inlet fluid stream at a higher temperature so as to utilize a higher thermal transfer efficiency from the fluid stream to the PCM material as the same passes therethrough whereby heat is efficiently withdrawn from the fluid stream and stored in the PCM body as it passes therethrough and exits therefrom substantially cooler.

4. A heat storage device for removing or adding heat from a fluid, a quantity of PCM, means for supporting said quantity in an array adapted for heat exchange relationship with said fluid and subdivided into channels to discourage stratification as the same is cycled through the fusion temperature, means forming an inlet and means forming an outlet for said fluid to be passed through said body and heat transfer contact therethrough, means for removing heat from the fluid at the outlet end, and means for receiving said heat from said last named means and for adding the same at a higher temperature to the fluid at the inlet end.

4,403,645

COMPACT STORAGE OF SEAT AND COOLNESS BY PHASE CHANGE MATERIALS WHILE PREVENTING STRATIFICATION

Calvin D. MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.

Continuation of Ser. No. 923,984, Jul. 12, 1978, Pat. No. 4,294,078, which is a continuation-in-part of Ser. No. 790,919, Apr. 26, 1977, abandoned. This application Feb. 5, 1981, Ser. No. 231,756

Int. Cl.³ F28D *21/00*; F25B *29/00*; F28D *17/00*

U.S. Cl. 165—10 **10 Claims**

7. Heat storage tank apparatus for temporarily storing heat energy comprising:

a thermally insulated tank having a fill port in the top thereof, liquid supply and return headers extending within said tank,

at least one grid of closely-spaced small diameter conduits of flexible plastic material connected at their ends to the respective headers and arranged within said tank to give multiple parallel liquid circuits through which a heat-transfer liquid can flow,

a liquid/solid phase change material substantially filling said tank and surrounding said grid of closely-spaced small diameter conduits,

spacer means in said tank associated with said grid for providing substantially uniform horizontal spacing of said small

diamter conduits of plastic material and permitting free flow of the phase change material in its liquid state throughout said tank,

said insulated tank, said flexible plastic conduits and said headers being formed of materials capable of withstanding temperature above and below the melting point of said liquid/-solid phase change material,

said grid being rolled into a spiral roll configuration as seen in cross section looking downwardly, and

said spacer means is low density matting having multiple spaces therein which has been rolled into said spiral roll configuration together with said grid, said matting and said grid being in alternate spiral layers as seen in cross section,

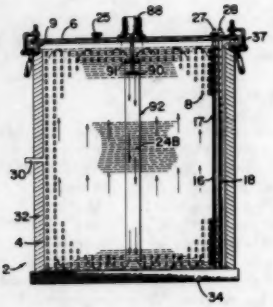
whereby said phase change material may be alternately melted and frozen throughout the interior of the mass thereof as heat is added thereto or withdrawn therefrom by circulating heat-transfer liquid through said conduit grid.

9. Heat storage tank apparatus for temporarily storing heat energy comprising:

a thermally insulated tank,

a liquid-conducting heat exchanger in said tank having supply and return connections thereto for feeding liquid into and out of said heat exchanger,

a liquid/solid phase change material substantially filling said tank in contact with said heat exchanger,



said heat exchanger substantially filling the tank for causing each region in the tank to be no more than a short distance away from the heat exchanger for freezing solid said phase change material throughout substantially the whole tank,

said insulated tank and said heat exchanger being formed of materials capable of withstanding temperature above and below the phase change temperature of said liquid/solid phase change material,

said liquid/solid phase change material being subject to stratification when in its liquid phase,

impelling means for circulating the liquid in the tank for preventing stratification,

motor means connected to said impelling means for driving the impelling means when the phase change material is in its liquid state,

an upright central conduit in said tank associated with said impelling means and extending through said heat exchanger, said conduit communicating with said phase change material near the bottom of said tank and communicating with said phase change material near the top of said tank, and

said impelling means impelling the phase change material through said upright conduit when said material is in its liquid state for said liquid to be recirculated through tank for preventing stratification of said material when in its liquid state.

4,403,646

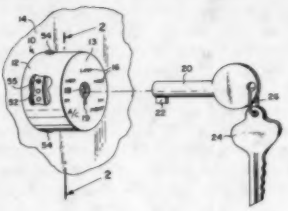
ENERGY SAVING THERMOSTAT

Anthony W. Foders, 55-28 138th St., Flushing, N.Y. 11355

Filed Sep. 7, 1982, Ser. No. 415,588

Int. Cl.³ H01H *37/04;* **G05D** *23/00*

U.S. Cl. 165—11 R **3 Claims**



1. A thermostatic room temperature control device, in combination, comprising:

a thermostat means rotatively mounted on a wall in a room, said thermostat adapted to be connected with a control means related to room temperature, said thermostat including a mounting piece having a face having a plurality of temperature setting indicators in association with said control means, said thermostat means being rotatable to said plurality of setting indicators, said thermostat being set in a first setting position;

a housing mounted to said wall enclosing said thermostat, said housing having a housing face with indicia, said face being in association with said setting indicators;

said housing forming an aperture and said thermostat means forming a keyway means, said aperture being adapted to pass a key to said keyway means, said keyway means being for rotating said thermostat between a first position and a plurality of selected second positions upon rotation of said key in said keyway means, said keyway means and said aperture also being for holding said key in said keyway means until said key is rotated to said first position and

a key holding means for holding said key along with the room key, whereby when the key is inserted into said device, the room key cannot be used until the key is rotated in the device and the thermostat is returned to its first setting position.

4,403,647

RADIATOR FILL APPARATUS FOR MOBILE ELECTRIC POWER GENERATING SYSTEMS

Joseph F. Melley, Jr., Davie, Fla., assignor to Melley Energy Systems, Pompano Beach, Fla.

Continuation of Ser. No. 883,391, Mar. 6, 1978, abandoned, which is a division of Ser. No. 759,209, Jan. 13, 1977, abandoned. This application Jun. 16, 1980, Ser. No. 159,660

Int. Cl.³ F01P *11/10, 11/18*

U.S. Cl. 165—41 **1 Claim**

1. In a substantially enclosed trailer carrying a power plant which produces heat during the operation thereof, the invention comprising:

means defining a roof opening in the top of said trailer;

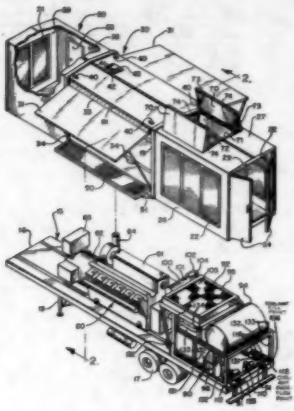
radiator means including a fluid reservoir having a fill opening through which fluid may be introduced into said reservoir and an overflow opening through which excess fluid may be discharged from said reservoir;

a first conduit extending from said fill opening to a fill point, located at a lower peripheral edge of said trailer, more readily accessible than the location of said fill opening; said first conduit being capable of transporting fluid from said fill point through said fill opening into said reservoir;

a second conduit extending from said overflow opening to an overflow point located adjacent the fill point at the

lower peripheral edge of said trailer such that the overflow point is more readily accessible than said overflow opening, said second conduit being capable of transporting excess fluid introduced into said reservoir from said reservoir to said overflow point, the passage of fluid from said overflow point being indicative that said reservoir is substantially full;

gate means having a first position covering said roof opening, and having a second position uncovering said roof opening;



means producing a signal during a start-up condition of said power plant occurring in advance of the beginning of the generating mode of said power plant;

means responsive to said signal for utilizing compressed air to move said gate means from said first position to said second position;

means for utilizing compressed air to maintain said gate means in said second position while said power plant is in said power generating mode.

4,403,648

ENGINE RADIATOR SUPPORT AND GUARD ASSEMBLY

Wayne G. Styok, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 47,599, Jun. 11, 1979, abandoned. This application May 11, 1981, Ser. No. 262,371

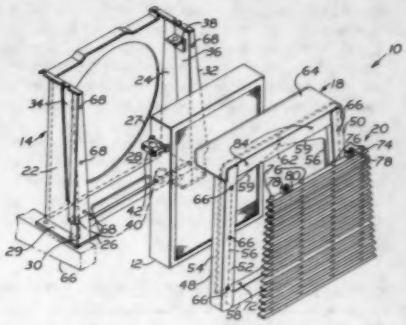
Int. Cl.³ F28F 9/00

U.S. Cl. 165—76 **11 Claims**

1. An engine radiator support and guard assembly comprising:

a support frame mountable adjacent an engine defining an open end distal the engine, said open end adapted to mountingly receive a radiator and an opening proximate the engine;

resilient means for mounting said radiator in said support frame;



a guard means fixable to said support frame in an overlapping relation thereto and distal of said engine.

4,403,649

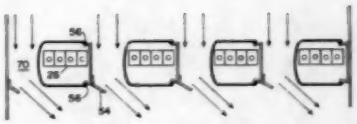
OMNI-DIRECTIONAL FACE-AND-BYPASS COIL

Ben B. Herschel, Howell, and Andrew Chaloka, Clark, both of N.J., assignors to Wing Industries, Inc., Cranford, N.J.

Filed Oct. 30, 1981, Ser. No. 316,828

Int. Cl.³ F28F 27/02; F24H 13/04

U.S. Cl. 165—101 **5 Claims**



1. A face-and-bypass coil apparatus comprising:

a frame including a pair of side panels, at least one upper panel attached to said side panels, and at least one lower panel also attached to said side panels and located on a portion of said side panels removed from said upper panel;

heating tubes pitched from between 1° and 3° with respect to the long axis of said side panels in order to avoid the accumulation of condensation within said heating tubes when said apparatus is mounted in a subsantially horizontal mode;

a top header attached to one end of said heating tubes;

a bottom header attached to the other end of said heating tubes;

movable means for attaching said bottom header to said frame so that said header floats and is free to respond to thermal expansions and contractions of said heating tubes;

fixed partition means connected to and extending between said upper and lower panels, said fixed partition means including a pair of flanges located on the leading and trailing edge of said partition means, said flanges facing towards said heating tubes and being slightly inclined towards each other;

movable damper means including a plurality of U-shaped damper means having two arms on opposite sides thereof, said two arms being resiliently related to each other in such a way that they respectively impinge upon the flanges of said fixed partition means in a sliding fit thereby camming said resilient arms of said movable damper means away from each other and forming a resilient compression seal with respect to said fixed partitions to sub-

stantially completely block off air which otherwise might base over said heating tubes;

mounting means for supporting said movable damper means so that said face-and-bypass coil can be installed in substantially any orientation ranging from vertical to horizontal with respect to gravity, said mounting means including linear ballbearing means attached to said frame and shaft means attached to said movable damper means, said shaft means being surrounded by said linear ballbearing means;

means for moving said movable damper means; and,

mixing and diverting baffle means attached to the trailing edge of said fixed partitions for improving the mix of bypass air with face-pass air and for equalizing system air flow volume with changes in damper opening position.

4,403,650

APPARATUS FOR FLOW OF A LIQUID MEDIUM

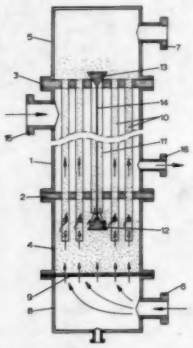
Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil BV, Amsterdam, Netherlands

Filed Nov. 9, 1981, Ser. No. 319,322

Claims priority, application Netherlands, Nov. 12, 1980, 8006161

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—104.16 **16 Claims**



1. In apparatus for flow of a liquid medium, comprising a plurality of vertical pipes whose bottom and top ends open respectively into a bottom chamber and a top chamber, the bottom and top chambers being respectively connected to supply inlet and discharge outlet for the liquid medium whereby in operation the medium flows upwardly through the pipes, there being present in the apparatus a mass of particles fluidisable by the flow of said medium so as to occupy, in the fluidized state, at least said pipes the improvement of: transfer means adapted to transfer said particles batchwise from said top chamber to said bottom chamber without the creation, in the transfer means, of a direct connection between said top and bottom chambers.

4,403,651

HEATPIPE WITH RESIDUAL GAS COLLECTOR VESSEL

Ulrich Groke, Duren, Fed. Rep. of Germany, assignor to Julich Gesellschaft mit beschrankter Haftung, Julich, Fed. Rep. of Germany

Filed Sep. 2, 1981, Ser. No. 298,353

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034192

Int. Cl.³ F28D *15/00*

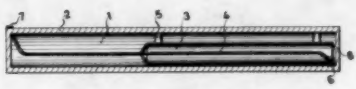
U.S. Cl. 165—104.27 **13 Claims**

3. A heatpipe having a gas collector for collecting residual gases, said heatpipe comprising:

(a) an elongated and hermetically sealed heatpipe, said heatpipe having a vaporization end and a condensation end;

(b) a sealed residual gas collection vessel mounted in said heatpipe adjacent the vaporization end, said vessel having a condensate collecting point and a residual gas collecting region;

(c) a working fluid for vaporization and condensation;



(d) a small diameter gas conducting tube, said conducting tube extending from the condensate end of said heatpipe to the condensate collecting point in said residual gas collector;

whereby non-working residual gases are conveyed from the condensate end of said heatpipe to the interior of said sealed gas collection vessel.

4,403,652

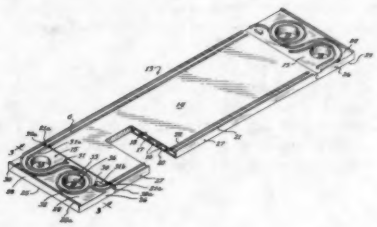
PLATE HEAT EXCHANGER

Ronald M. Schiltz, and Alan H. Corlett, both of Lake Mills, Wis., assignors to Crepaco, Inc., Lake Mills, Wis.

Filed Apr. 1, 1981, Ser. No. 249,855

Int. Cl.³ F28F *3/12, 3/10*

U.S. Cl. 165—167 **7 Claims**



1. A plate heat exchanger for accommodating two circulating heat exchange mediums, one of which is at a substantially higher pressure than the other, said heat exchanger comprising a plurality of plates mounted in abutting superposed face-to-face relation and defining first flow-paths for the heat exchange medium having the highest pressure and second flow-paths for the other heat exchange medium, said first and second flow-paths being independent of one another; inlet and outlet means for each flow-path; and compressible sealing gasket means interposed each pair of abutting plates and delimiting the second flow-paths; each plate including an elongated extruded section of heat conductive material, said section having opposed broad planar exterior surfaces, opposite ends of said section being connected to said inlet and outlet means, said section being provided with a plurality of elongated internal coextensive passages spanning the distance between said opposite ends, adjacent passages being separated from one another by continuous narrow webs integral with and interconnecting the opposed broad surfaces, said internal passages forming said first flow-paths; opposed broad surfaces of adjacent plates and said interposed gasket means coacting to form at least one second flow-path; at least one of the opposed broad surfaces being provided with peripheral laterally spaced ribs between which segments of the gasket means are disposed when compressed and are restrained by said ribs from lateral

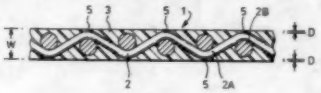
shifting beyond the periphery of said section when the heat exchange medium with the lower pressure is circulated through the second flow-path.

4,403,653

HEAT TRANSFER ELEMENTS

Maxwell W. Davidson, 31/32 Moray Pl., Edinburgh, Scotland EH3 6BZ

Continuation-in-part of Ser. No. 933,130, Aug. 9, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 143,840
Claims priority, application United Kingdom, Aug. 11, 1977, 33662/77
Int. Cl.³ F28F 3/04, 21/06
U.S. Cl. 165—170 10 Claims



1. Heat transfer sheet material for use in the construction of heat exchangers and particularly for the formation of heating tubes, said sheet material serving for transfer of heat between zones on either side of the material and comprising a thin composite wall member having a solid voidless interior, said wall member being made from wall portions of different thermal conductivity, one wall portion of higher thermal conductivity comprising a close metal mesh with weft and warp strands woven together to define a nodal network, while a further wall portion of lower thermal conductivity plastics material constitutes a closure layer, said closure layer extending in the longitudinal direction of the metal mesh with outer surfaces parallel to the mesh and with the mesh embedded in the closure layer, the respective nodes of the network being located at said outer surfaces of the closure layer but with thin coatings of plastics material covering the nodes for protection of the mesh, said thin coatings presenting virtually no barrier to heat so that heat is transferred by the full area of the mesh from one outer surface of the wall member transversely across the layer and perpendicular to the mesh to the other outer surface of the wall member.

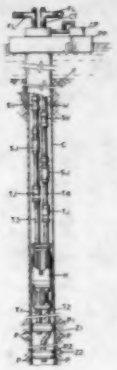
4,403,654

TORQUE TRANSMITTING EXPANSION JOINT AND A HANGER ASSEMBLY INCORPORATING SAME

Andrew Haynes, Missouri City, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Mar. 23, 1981, Ser. No. 246,767
Int. Cl.³ E21B 17/07
U.S. Cl. 166—73 13 Claims

6. An apparatus for producing a well from productive zones penetrated by the well bore in which casing is set below the top of the well, said apparatus comprising: a downhole tubing hanger means secured to an upper level of the casing and supporting at least one lower production tubing string communicating with a production zone; a surface tubing hanger arranged to seat in a hanger bowl in the top portion of the casing; at least one space-out tubing string extending from said downhole hanger to said surface hanger and removably sealingly connectable in said downhole hanger to said lower production string to transmit production fluid from said lower production tubing string to the surface, each said space-out tubing string including a safety valve and a torque transmitting telescoping joint, said joint including means operable by successive recirocations of said space-out tubing string for selectively limiting the axial contraction movement of said telescopic joint to



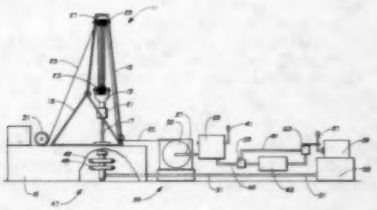
facilitate seating of said space-out tubing string in said downhole tubing hanger.

4,403,655

DRAW WORKS DISABLING DEVICE FOR USE WITH A WELL DRILLING APPARATUS

Buster B. Trout, 1220 Idaho, Chickasha, Okla. 73018

Filed Feb. 20, 1981, Ser. No. 236,318
Int. Cl.³ E21B 7/00
U.S. Cl. 166—75 R 13 Claims



1. A device for disabling the draw works of a well drilling apparatus of the type which includes a pressurized air supply connected through a draw works valve for actuating the draw works and an accumulator connected through an accumulator valve for supplying hydraulic fluid to a blow out prevention device which locks the drill string against movement, comprising:

a first valve for regulating the supply of air from said pressurized air supply to said draw works; and

fluid conveyance means for actuating said first valve responsive to the actuation of said accumulator holding said drill string against movement for actuation of said first valve such that said pressurized air supply is isolated from said draw works and such that the movement of said draw works is prevented.

4,403,656

PERMANENT THERMAL PACKER

Johan F. Ploeg, Fullerton, and Arlo L. Oden, Bakersfield, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 29, 1981, Ser. No. 288,258
Int. Cl.³ E21B 33/12, 33/13
U.S. Cl. 166—179 6 Claims

1. A subsurface injection well completion combination, said well completion being installed within said well above an interval in said subsurface into which high temperature fluids are to be injected, comprising:

(a) a well casing fixed to the subsurface penetrated by said well so as to substantially completely seal said casing to said subsurface;

(b) an injection tubing within said casing, said tubing establishing a path for said high temperature fluids from the earth's surface to said subsurface;

(c) and a cement packer between the inside surface of said casing and the outside surface of said tubing, said cement packer being capable of withstanding temperatures higher than the temperature of said high temperature fluids injected through said injection tubing,

said packer being of substantial length along said well and completely sealing and filling the annulus between said casing and said tubing along said length of said packer.

4,403,657

LOCKING MANDREL HAVING DOGS FOR LATCHING TO A LANDING NIPPLE AND LUGS FOR LATCHING TO AN OPERATOR RECIPROCAL IN THE LANDING NIPPLE

James B. Adams, Jr., Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 6, 1981, Ser. No. 222,773
Int. Cl.³ E21B 34/14
U.S. Cl. 166—322 8 Claims

1. A subsurface safety valve comprising, a body,

a valve member and seat controlling flow through the body,

a valve actuator reciprocal in the body,

dogs carried by the body for latching the body in a landing nipple,

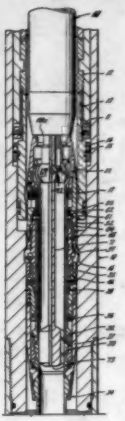
lugs carried by the actuator for latching the actuator to an operator reciprocal in the landing nipple,

a dog prop-out for latching the dogs in extended position,

a lug expander for latching the lugs in extended position,

said lug expander when moving to lug extending position shifting said dog prop-out to dog extending position,

detent-latch means releasably securing said actuator to said lug expander in lug expanded position for reciprocation as a unit in response to movement of said lug expander to lug expanding position and thereafter releasing said lug expander from said actuator and latching said lug expander to said dog prop-out in response to relative reciprocation of said lug expander and actuator.

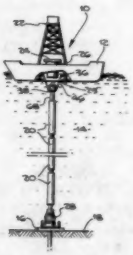


4,403,658

MULTILINE RISER SUPPORT AND CONNECTION SYSTEM AND METHOD FOR SUBSEA WELLS

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Sep. 4, 1980, Ser. No. 183,881
Int. Cl.³ E21B 19/09
U.S. Cl. 166—355 15 Claims



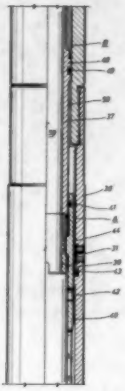
1. In a support and connection system for a subsea well having a multiline riser run in sections from a floating platform to said subsea well including an uppermost riser, the improvement comprising: support housing means mounted upon said platform; termination means disconnectably mounted within said support housing means for supporting said uppermost riser of said multiline riser run depending therefrom and having passageways communicating with said multilines within said riser; hose means connected to said termination means for communicating with said passageways; and means for disconnecting said termination means from said uppermost riser while retaining said hose means connected to said termination means; whereby assembly, hang off and recovery operations may be conducted without connecting and disconnecting said hose means.

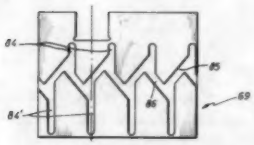
4,403,659

PRESSURE CONTROLLED REVERSING VALVE

James M. Upchurch, Stafford, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,786
Int. Cl.³ E21B 34/10
U.S. Cl. 166—374 17 Claims





1. In a well testing apparatus having test tool components adapted to be suspended in a well bore on a pipe string, normally closed reversing valve means including a housing having laterally directed port means adapted to communicate the bore of the pipe string with the well annulus, and means responsive to at least a predetermined minimum number of pressure changes in the pipe string for operating said reversing valve means to enable formation fluids to be removed from the pipe string by reverse circulation of well fluids.

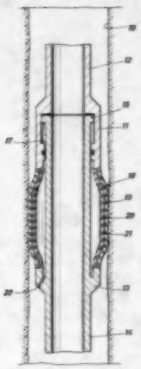
4,403,660

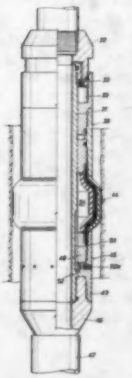
WELL PACKER AND METHOD OF USE THEREOF

Malcolm G. Coone, Houston, Tex., assignor to MGC Oil Tools, Inc., Houston, Tex.

Filed Aug. 8, 1980, Ser. No. 176,403
Int. Cl.³ E21B 33/127, 33/128
U.S. Cl. 166—387 7 Claims

1. A well packer for controlling the flow of fluid through a conduit in a wall bore, such as through the annulus between the drill pipe and the wall of the well bore comprising a tubular mandrel positioned along the longitudinal axis of the conduit, spaced annular packer heads mounted on the mandrel with at least one movable along the mandrel toward the other packer head, a packing element including a plurality of elongated, relatively narrow, strips of reinforcing material connected to and extending between the packer heads and arranged in a circle to bend away from the mandrel when the packer heads are moved together and inner and outer sheaths of elastomeric material positioned inside and outside the reinforcing strips and between the packer heads with the ends of the inner sheaths in sealing engagement with the packer heads, means for moving one of the packer heads toward the other to cause the reinforcing strips of the packing element to bend away from the mandrel to move the center portion of the packing element away from the mandrel and into sealing engagement with the well bore, and an opening in one of the packer heads through which the fluid in the conduit that is upstream from the packing element can enter the space between the mandrel and the packing element to exert pressure on the inside of the packing element and provide an additional force holding the packing element in its set position that varies directly with upstream pressure and combines with the force exerted on the well bore by the reinforcing strips to provide sufficient friction between the packing element and the well bore to hold the packer from movement relative to the well bore.





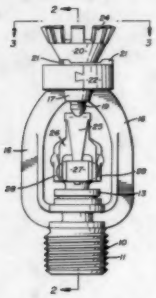
6. A method of sealing the annular space between a pipe string and the wall of the well bore comprising applying a compressing force in an axial direction to an imperforate tubular packing element carried by the pipe string to force the packing element to bow outwardly away from the pipe string and into engagement with the well bore while holding the ends of the packing element from moving outwardly away from the pipe string, holding the compressing force on the packing element, and supplying the space between the bowed out packing element and the pipe string with fluid from the annular space that is upstream of the packing element to allow the pressure of such fluid to enhance the seal between the packing element and the wall of the well bore in proportion to the pressure differential across the packing element and to anchor the packing element in the well bore.

4,403,661

AUTOMATIC SPRAY NOZZLE

Thomas Tokar, Garfield Heights, Ohio, assignor to A-T-O Inc., Willoughby, Ohio

Filed Apr. 9, 1981, Ser. No. 252,283
Int. Cl.³ A62C 37/08
U.S. Cl. 169—38 7 Claims



1. An improvement in a spray nozzle for distributing fluid in a spray pattern, the improvement comprising means for deflecting said fluid throughout an entire conical spray pattern, said spray nozzle comprising a body member having a fluid delivery passageway therethrough, oppositely disposed arms on said body member forming a frame outwardly of said fluid passageway and joined at their outer ends, a fitting positioned through a secondary passageway in said joined ends of said arms on the axial center line of said fluid delivery passageway, said means for deflecting said fluid through an entire conical spray pattern comprising an inverted conical deflector having a large end and a small end and positioned on said fitting with its small end adjacent said joined ends of said arms, a spider comprising at least two circumferentially spaced radially extending thin portions arranged with their smallest dimensions facing said fluid delivery passageway and positioned on said fitting between said joined ends of said arms and said conical deflector and a cylindrical ferrule on said outer ends of said radially extending thin portions of said spider coaxially positioned with respect to said fitting.

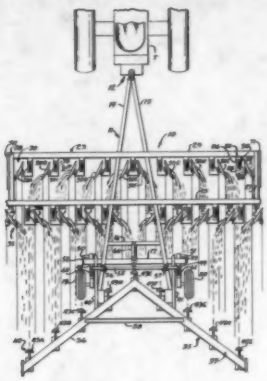
4,403,662

ONE-PASS COMPLETE TILLAGE SYSTEM

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Continuation-in-part of Ser. No. 934,585, Aug. 17, 1978, Pat. No. 4,245,706. This application Dec. 29, 1980, Ser. No. 220,419
Int. Cl.³ A01B 13/08
U.S. Cl. 172—156 34 Claims

1. Tillage apparatus adapted to be pulled by a vehicle, comprising: a frame having a longitudinal center line parallel to the direction of travel of said vehicle; wheels for supporting said frame; a first set of disc blades carried by said frame and widely spaced laterally to form alternate strips of cleared land and first windrows of trash and soil on previously undisturbed soil; a second set of disc blades carried by said frame behind said first set, said blades of said second set being widely spaced and located to part the windrows formed by said first set of blades and to displace at least some of the accumulated mixture in said first windrows, and to clear some previously undisturbed soil for forming second windrows laterally displaced from said first windrows, said second windrows being at least partly on previously undisturbed soil; and a plurality of plow points carried by said frame behind said blades, said plow points being located to till said strips of previously untilled soil on which said second windrows at least partially rest and including a forward edge for breaking soil at a depth greater than the working level of said blades, said plow points further including wing means for lifting and twisting the broken soil, thereby mixing the broken



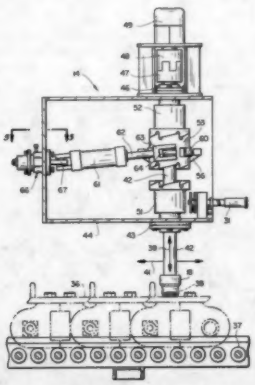
soil with the windrowed trash and top soil, and distributing the mixture without creating a new plow sole.

4,403,663

POWER-OPERATED TORQUE WRENCH

Harvey W. Janssen, Lafayette, Calif., assignor to Wolff Manufacturing Company, Burlingame, Calif.

Filed Apr. 13, 1981, Ser. No. 253,106
Int. Cl.³ B25B 21/00
U.S. Cl. 173—12 8 Claims



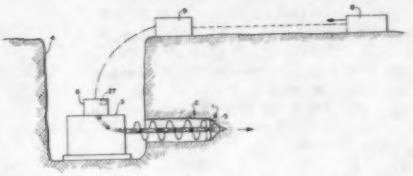
1. A power operated wrench comprising a drive shaft adapted to receive a socket, a motor coupled to said shaft for rotating said shaft, drive means including an overriding clutch means coupled to said shaft to drive and rotate said shaft when the motor is not driving the shaft for applying higher torque to said shaft than the torque capacity of said motor, means for controlling said drive means to apply a predetermined torque to said shaft and then to rotate said shaft through an additional predetermined angle of rotation.

4,403,664

EARTH BORING MACHINE AND METHOD

Richard Sullinger, 32135 Cook Rd., North Ridgeville, Ohio 44039

Filed Aug. 28, 1980, Ser. No. 182,413
Int. Cl.³ E21B 44/00
U.S. Cl. 175—24 31 Claims



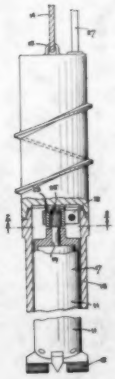
1. Remote controlled earth boring machine comprising,
means for boring a hole through the earth, said means for boring including a cutting head and auger means connected to said cutting head,
means for detecting the direction of said boring means in a bore hole,
means for adjusting the direction of said boring means in a bore hole,
means for producing an above-ground reference line for a hole to be bored, said reference line extending in a direction having at least a directional component which is essentially parallel to a corresponding directional component of said hole to be bored,
means for detecting the direction of at least said directional component of said reference line, and
means for remotely controlling said adjusting means whereby the direction of said boring means can be adjusted to at least said directional component of said reference line.

4,403,665

SONIC SYSTEM FOR PROPELLING PILINGS, DRILLS AND THE LIKE INTO THE EARTH EMPLOYING SCREW DEVICE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part of Ser. No. 76,194, Sep. 17, 1979, Pat. No. 4,266,619, which is a continuation-in-part of Ser. No. 64,046, Aug. 6, 1979, Pat. No. 4,261,425, and a continuation-in-part of Ser. No. 63,840, Aug. 6, 1979, Pat. No. 4,271,915. This application May 11, 1981, Ser. No. 262,650
Int. Cl.³ E21B 7/24
U.S. Cl. 175—55 11 Claims



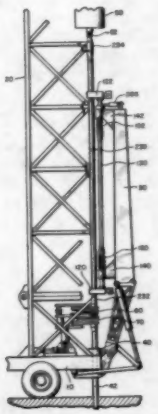
1. A system for cycloidally driving a column through earthen material, said column being activated in a bore hole formed in said earthen material, comprising
a spiral flute formed in at least a portion of the outer surface of said column, said flute being in firm engagement with the earthen material surrounding said bore hole,
a rotor having an eccentric mass,
means for rotatably supporting said rotor on said column with the axis of rotation of the rotor being substantially parallel to the longitudinal axis of the column, and
means for rotatably driving the rotor to generate a force vector in said column which is generally transverse of the longitudinal axis thereof and which rotates about an axis substantially parallel to the longitudinal axis of the column to cause cycloidal vibration of the column,
the fluted portion of said column precessing with a cycloidal motion around the side wall of the bore hole in forceful driving engagement thereagainst.

4,403,666

SELF CENTERING TONGS AND TRANSFER ARM FOR DRILLING APPARATUS

Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co. Inc., Wichita Falls, Tex.

Filed Jun. 1, 1981, Ser. No. 269,279
Int. Cl.³ F21B 19/00
U.S. Cl. 175—85 31 Claims



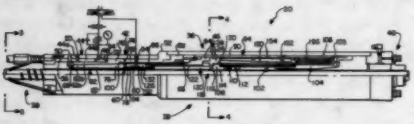
1. In combination with a drilling apparatus comprising a mast and a transfer arm positioned adjacent the mast to move down hole tubulars between a lowered position near ground level and a raised position aligned with the mast, the improvement comprising:
at least one clamp adapted to grip a down hole tubular having at least one threaded end;
means for mounting the clamp to the transfer arm such that the clamp is movable along an axis which is substantially parallel to the longitudinal axis of a tubular clamped in the at least one clamp; and
means for resiliently biasing the clamp to a rest position with respect to the transfer arm;
said mounting means and biasing means cooperating to permit movement of the clamp under axial loads applied to a clamped down hole tubular during tubular handling operations, thereby reducing wear and damage to the threaded end of the clamped tubular.

4,403,667

CABLE FOLLOWING APPARATUS UTILIZING A RELEASABLE CABLE GRIPPING MECHANISM

James M. Reichman, Issaquah, and . Douglas P. Kelley, Redmond, both of Wash., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 3, 1981, Ser. No. 289,211
Int. Cl.³ E21B *19/08*
U.S. Cl. 175—230 13 Claims



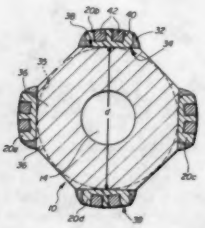
1. An apparatus for moving along the length of an existing cable in a forward direction, comprising: a main body including first and second segments interconnected for limited slidable movement relative to one another; means for supporting said main body to said cable such that alternating sliding movement of said body segments in said forward direction causes said main body to slide forward along said cable, said supporting means including cable gripping means connected with said first body segment and movable between a first position in engagement with said cable for preventing said first segment from sliding along said cable and a second position out of engagement with said cable; means for causing said first and second body segments to slide alternately in the forward direction; and means cooperating with said last-mentioned means for maintaining said gripping means in its cable engaging first position during sliding movement of said second segment and in its second position out of engagement with said cable during sliding movement of said first segment.

4,403,668

STABILIZING DRILL COLLAR

Rickey H. Ramsey, Rte. 1, Palacios, Tex. 77465

Filed Dec. 7, 1981, Ser. No. 328,118
Int. Cl.³ E21B *17/10*
U.S. Cl. 175—325 10 Claims



1. A stabilizing drill collar connectable in a drill string comprising:

an elongated body having eight flat sides of substantially the same width extending longitudinally along the length thereof, with pairs of sides being diametrically opposite, and having a longitudinal internal flow passage extending therethrough;

the elongated body having an effective diameter measured between the middle of opposing flat sides of said elongated body;

a plurality of wear members welded to at least four alternating sides of said eight sides and extending longitudinally along at least a portion of said sides;

a plurality of longitudinally extending rib members connecting said wear members along each side containing said wear members, whereby there is a longitudinally continuous combination of wear members and rib members; and

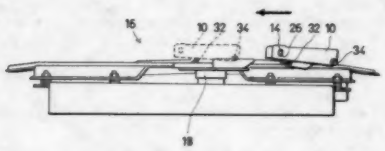
said wear members being welded to said sides on portions outside said effective diameter wherein the area of said collar affected by the heat of welding said wear members thereto is outside said diameter of said elongated body.

4,403,669

APPARATUS FOR WEIGHING CONTINUOUSLY-MOVING ARTICLES PARTICULARLY USEFUL FOR GRADING PRODUCE

Omri Raz, Hagalil Hamaaravi, Israel, assignor to Eshet Eilon, Hagalil Hamaaravi, Israel

Filed Jan. 18, 1982, Ser. No. 340,275
Int. Cl.³ G01G *19/00, 21/22;* B07C *5/16*
U.S. Cl. 177—145 10 Claims



1. Apparatus for weighing continuously moving articles, comprising a plurality of trays for receiving the articles to be weighed, a weighing device, and drive means for moving said trays one-at-a-time longitudinally across said weighing device, characterized:

in that said weighing device comprises a first pair of rails at one end thereof extending parallel to and on opposite sides of its longitudinal axis, and a second pair of rails at the opposite end thereof extending parallel to and on opposite sides of its longitudinal axis;

and in that each of said trays comprises a first pair of contact points adjacent to the leading end thereof on opposite sides of its longitudinal axis engageable with one pair of rails during at least a portion of the movement of the tray across the weighing device, and a second pair of contact points adjacent to the trailing end thereof on opposite sides of its longitudinal axis engageable with the other pair of rails substantially concommittently with the engagement of the first pair of rails by said first pair of contact points, such that said tray is supported by said two pairs of contact points engaging said two pairs of rails for a substantial portion of the movement of each tray across said weighing device.

4,403,670

ADJUSTABLE DRAWBAR

Peter Sammarco, Downers Grove, Ill., assignor to International Harvester Co., Chicago, Ill.

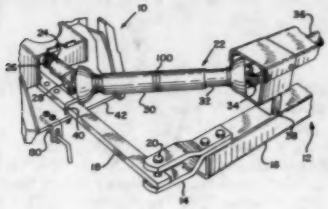
Filed Jun. 10, 1981, Ser. No. 272,146
Int. Cl.³ B60D *1/02*
U.S. Cl. 180—14 R 7 Claims

1. In a tractor having a drawbar for towing two separate implements and a PTO shaft for powering said implements, said drawbar having a hitch hole end for pivotal connection to said implements and a pivot end for attachment to the tractor, said implements having power shafts capable of coupling with said PTO shaft, said shafts having lengths which differ by a given amount, the improvement comprising:

a bracket affixed to said tractor and having an aperture therein;

said pivot end having a pair of holes spaced apart a distance equal to one-half said given amount and capable of being aligned with said aperture;

a pin capable of insertion through said aperture and an aligned one of said holes; and



means mounting said pin on said tractor to permit selective removal and insertion of said pin.

4,403,671

FRONT AXLE BEARING BLOCK

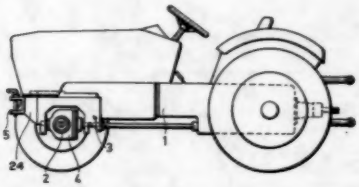
Theo Schmahl, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 54,701, Jul. 5, 1979, abandoned. This application May 21, 1981, Ser. No. 266,056

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1982, 2829455

Int. Cl.³ B60G *7/00*; B60K *17/28*

U.S. Cl. 180—53 R **11 Claims**



1. A multi-part front axle bearing block assembly for supporting a pendulum-type front axle mounted via a transverse trunnion, said block being used interchangeable with self-propelled utility vehicles of various sizes and drive configurations, which vehicles selectively mount a plurality of accessories including: pulling hitches, ballast weights and power take-offs; the front axle bearing block assembly including:

a universally used main component having a front end with a bearing therein for receiving the transverse trunnion, a top surface and a pair of spaced side walls through which the axle passes;

means mountable on the front end of the main component for mounting the accessories;

a height equalizing intermediate member positionable on the top surface of the main component for receiving the engine enclosure thereupon and for determining the height of the engine enclosure with respect to the top of the main component whereby engine enclosures of various sizes may be used in combination with a single universal main component configuration, and

two carrying elements interchangeable with one another and attachable to the front end of the main component beneath the intermediate member.

10. A multi-part front axle bearing block assembly according to claim 1 wherein said main component member includes a slip clutch supported therein for operative connection to a power take-off when a power take-off is attached to the main component.

4,403,672

DUAL LINKAGE COUPLING MECHANISM FOR A MOPED FOR ENGAGING A MOTOR DRIVEN PULLEY WITH THE MOPED REAR WHEEL

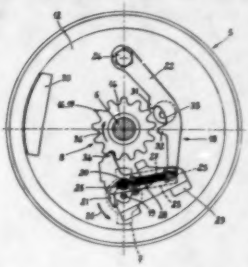
Christian Jaulmes, Paris, France, assignor to Ateliers de la Motobecane S.A., Pantin, France

Filed Jun. 2, 1981, Ser. No. 269,783

Claims priority, application France, Jun. 13, 1980, 80 13140

Int. Cl.³ B62M *23/02*

U.S. Cl. 180—205 **6 Claims**



1. In a moped having a motor, a rear wheel, a rotatable pedal crank including an axle carrying pinion gear means rotatable with said crank axle for drivingly coupling the axle with the rear wheel, and a pulley, driven by the motor, for rotation about the axle, a coupling mechanism for selectively coupling the pulley with the pinion gear means, comprising:

a first lever having first and second ends, said first end being pivotably connected to said pulley, said first lever including means, disposed between said first and second ends, for selectively engaging said pinion gear means to whereby selectively lock the pulley to the pinion gear means;

a second lever having first and second ends, said second lever being pivotably connected to said pulley, said first end of said second lever including a nose portion for selective engagement with said pinion gear means, the second ends of said first and second levers being pivotably interconnected to each other; and

actuating means, rotatably connected to said pulley and connected to said second lever, said actuating means including means for moving said coupling mechanism,

(1) from a first position in which said first lever engaging means and said second lever nose portion are disengaged from said pinion gear means,

(2) to a second position in which said first lever engaging means is disengaged from said pinion gear means and said second lever nose portion is engaged with said pinion gear means, and then

(3) to a third position in which said first lever engaging means is engaged with said pinion gear means and said second lever nose portion is disengaged from said pinion gear means,

whereby said coupling mechanism smoothly, efficiently and positively couples said engine with said back wheel.

4,403,673

POWERED VEHICLE

Douglas Ball, 190 Senneville Rd., Senneville, Quebec, Canada H9X 1B9

Filed Jan. 6, 1981, Ser. No. 222,939

Int. Cl.³ B62D *61/08*

U.S. Cl. 180—214 **8 Claims**

1. A powered vehicle comprising,

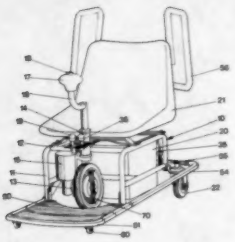
at least one steerable central front wheel, the front wheel

being steerable at least about 90° on either side of a straight ahead direction,

power means to drive the front wheel in forward and reverse directions,

at least two rear swivel caster wheels forming a tricycle arrangement with the central front wheel, each said caster wheel having a swivel point and an axle offset from said swivel point whereby said caster wheels normally trail said front wheel when the vehicle is going in a straight ahead direction,

means connected with each of the caster wheels to provide a free position wherein each caster wheel is independently



free to swivel in any direction, to provide an intermediate position wherein each caster wheel is independently free and unrestrained to swivel from a normal straight ahead direction outwards through an angle of approximately 180° to a reversed straight ahead direction and inwards through an angle of approximately 45°, and to provide a locked position for at least one caster wheel wherein the caster wheel is lockable in the straight ahead direction,

remote control selector means to change between the free position, the intermediate position, and the locked position of the caster wheel, and

spring loaded side bumpers mounted on said vehicle.

4,403,674

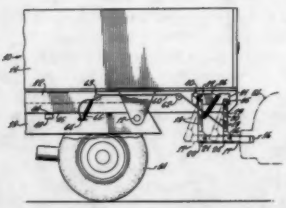
VEHICLE SAFETY BRAKING SYSTEM

Charles S. Viall, Sr., 1150D S. State College Blvd., Anaheim, Calif. 92806; Charles S. Viall, Jr., 3401 Gaviota, Long Beach, Calif. 90008, and Harold S. Viall, 938 S. Chancer, Anaheim, Calif. 92806

Continuation of Ser. No. 109,759, Jan. 7, 1980, abandoned, which is a division of Ser. No. 913,350, Jun. 7, 1978, Pat. No. 4,207,958, which is a division of Ser. No. 646,287, Jan. 2, 1976, Pat. No. 4,105,238. This application Nov. 13, 1981, Ser. No. 321,068

Int. Cl.³ B60K *28/00*; B60R *19/02*

U.S. Cl. 180—275 **10 Claims**



1. A safety device for a vehicle having brakes comprising:

means for sensing the placement of the vehicle in neutral gear;

means for applying the brakes of the vehicle;

means carried by said vehicle for engaging obstacles in the vehicle's path;

means for actuating said brake applying means in response to said neutral gear sensing means and engagement of an obstacle by said engaging means.

4,403,675

ANTI-THEFT DEVICE OR SYSTEM FOR VEHICLES

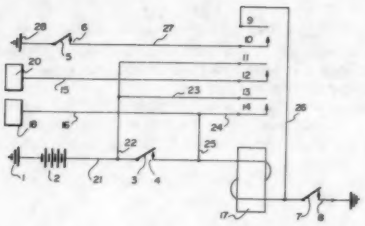
John A. Cardwell, c/o William Cardwell, 1216 18th St., NE., Calgary, Alberta, Canada

Continuation-in-part of Ser. No. 256,513, Apr. 22, 1981, abandoned, which is a continuation of Ser. No. 96,508, Nov. 21, 1979, abandoned, which is a continuation of Ser. No. 925,744, Jul. 18, 1978, abandoned. This application Sep. 10, 1982, Ser. No. 416,506

Claims priority, application Canada, Jul. 18, 1977, 282950

Int. Cl.³ B60R *25/04*

U.S. Cl. 180—287 **4 Claims**



1. In a vehicle having an engine ignition system controlled by a key-actuated ignition switch, the improvement comprising selectively controllable means for bypassing said ignition switch to permit opening of the ignition switch and removal of the key without de-energizing the ignition system but de-energizing the ignition system upon attempted operation of the vehicle while the ignition switch is open, said selectively controllable means comprising a first switch means constructed and arranged to be activated by movement of a vehicle operational component to a position which precludes normal operation of the vehicle, second switch means actuatable by the vehicle operator, and means responsive to activation of said first switch and actuation of said second switch when said ignition switch is closed for bypassing said ignition switch so long as said first switch remains activated, and regardless of the state of said ignition switch and said second switch, whereby the ignition switch can be opened and the key removed without de-energizing the ignition system, and attempted operation of the vehicle by movement of said component to a position which does not preclude vehicle operation will de-energize the ignition system unless said ignition switch is closed.

4,403,676

TRANSMISSION WITH DIFFERENTIAL WITH LONGER POWER OUTPUT SHAFT SUPPORT CASING

Masao Fujii, and Tetuo Hattori, both of Toyota, Japan, assignors to Toyoto Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 1, 1981, Ser. No. 279,570

Claims priority, application Japan, Sep. 16, 1980, 55-128172

Int. Cl.³ B60K *5/04*

U.S. Cl. 180—297 **12 Claims**

1. In a vehicle comprising two axially opposed driven wheels, a transmission comprising:

(a) two drive shafts of equal length, each flexibly drivingly coupled at its outer end to one of said wheels; and

(b) a differential axially located closer to a first one of said wheels and further from the other one of said wheels, comprising:

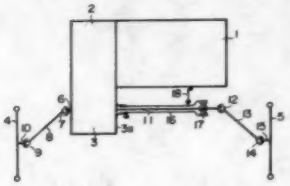
(b1) a casing;

(b2) a short power output shaft extending towards said first wheel and flexibly drivingly coupled at its outer end to the inner end of the one of said drive shafts whose outer end is drivingly connected to said first wheel;

(b3) a long power output shaft extending towards said other wheel and flexibly drivingly coupled at its outer end to the inner end of the one of said drive shafts whose outer end is drivingly connected to said other wheel;

(b4) a stiff tubular housing through which said long power output shaft passes, which is fixed at its inner end to said casing; and

(b5) a bearing mounted in the outer end of said tubular



housing and rotatably supporting an outer part of said long power output shaft;

(b6) said casing being formed with a cylindrical receiving aperture, and said tubular housing being formed with a cylindrical end portion which mates into said cylindrical receiving aperture and fixes said tubular housing to said casing in a fixed orientation; said differential further comprising a carrier and a carrier bearing which rotationally supports said carrier about a rotational axis collinear with the rotational axis of said long power output shaft, said casing being formed with a bearing hole which supports said carrier bearing, and said cylindrical receiving aperture being formed as a direct continuation of said bearing hole and being coaxial with said bearing hole.

4,403,677

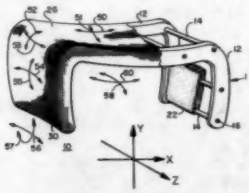
SPACE DIVIDERS AND METHOD OF MANUFACTURE

Alexander Messinger, 3725 Lankenau Rd., Philadelphia, Pa. 19131

Continuation-in-part of Ser. No. 4,438, Jan. 18, 1979, Pat. No. 4,230,365. This application Oct. 28, 1980, Ser. No. 201,598

Int. Cl.³ E04B *1/82*

U.S. Cl. 181—295 **11 Claims**



1. A space divider, comprising:

at least two peripheral frames, each having at least two arcuate portions;

cross-members holding the peripheral frames in spaced relationship; and,

a soft, stretchable fabric sleeve stretched over and entirely covering the peripheral frames and cross-members, the fabric resiliently forming itself into at least two major omni-directional sound controlling double-curvilinear surfaces in a natural equilibrium condition, the soft fabric absorbing the sound, the cross-members being so formed and positioned as to not interfere with the at least two major self-forming double-curvilinear surfaces.

4,403,678

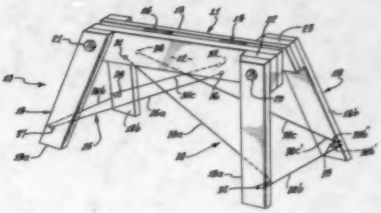
FOLDING SAW HORSE

Steven A. Zieg, Anaheim Hills, Calif., assignor to Mansion Industries, Inc., Industry, Calif.

Filed Nov. 2, 1981, Ser. No. 316,813

Int. Cl.³ B27B *21/00*; F16M *11/00*

U.S. Cl. 182—153 **12 Claims**



1. In a saw horse, the combination comprising

(a) generally horizontally extending upper frame structure,

(b) two pairs of legs pivotally connected to the frame structure to independently and swingably move toward each other between extended positions in which the frame structure is supported on the legs, and collapsed positions proximate that structure, and

(c) flexible connector means operatively connected with the legs and the upper frame structure to limit such independent swinging movement of the pairs of legs relatively away from one another at said extended positions,

(d) said upper frame structure including two longitudinally elongated frame members, the two legs of each of said pairs respectively connected to said members, and hinge means interconnecting said members to pivot laterally relative to one another, said flexible connector means also connected with said members to limit said member relative lateral pivoting.

4,403,679

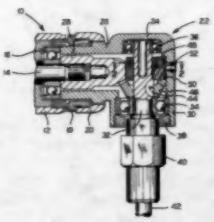
ANGLE DRIVE LUBRICATOR

Philip A. Snider, Hicksville, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 1, 1981, Ser. No. 249,987

Int. Cl.³ F16N *7/18*

U.S. Cl. 184—64 **10 Claims**



1. In a tool having a motor housing with a rotatable drive shaft at one end terminating in a bevel pinion, an angle drive attachment comprising:

an angular housing having a first leg and a second leg;

an output shaft journalled in said second leg of said angular housing;

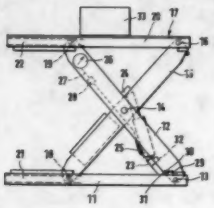
a bevel gear secured to said output shaft and disposed for engagement and rotation with the bevel pinion;
an annular absorbent sleeve disposed within said housing and adjacent said bevel gear; and
means for maintaining said absorbent sleeve stationary within said housing.

4,403,680

HYDRAULICALLY DRIVEN LIFTING, LOADING OR TIPPING PLATFORM

Walter Hillesheimer, Neu-Isenburg, Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,433
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1980, 3042656
Int. Cl.³ B66B 11/04
U.S. Cl. 187—18 20 Claims



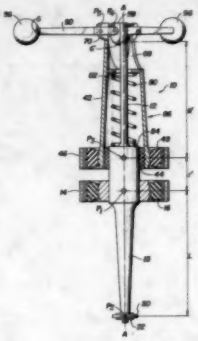
1. A hydraulically-operable platform-movng device, comprising in combination:
a platform adapted to hold a load,
moving means for moving said platform at least between a first position, and a second position at least partly elevated with respect to said first position, and wherein friction effects occur when said platform is moved, and the accuracy of the weight of the load resting on the platform may be impaired by said friction effects,
hydraulic cyliner-piston drive means for driving said moving means, being adapted to be energized by energizing means, said energizing means including a pump exerting pressure on at least a portion of said fluid, said hydraulic cylinder piston-drive means having a predetermined hydrostatic pressure prevailing therein, and including a hydraulic circuit,
hydraulically operable measuring means for determining the weight of the load resting on the platform,
indicating means connected to said measuring means, and including a scale subdivided into units of weight for indicating the weight on the load on said scale, and having a zero point, and a pointer settable so that said pointer coincides with said zero point at a predetermined position of said platform., when said platform is free of any load,
a hydraulic line connecting said hydraulic circuit to said measuring means,
switching means disposed in said hydraulic circuit, and adapted to operatively control, supply, and remove hydraulic fluid to, and from said hydraulic circuit, respectively, and including
a first valve disposed in said hydraulic line for controlling the hydraulic fluid flow between said hydraulic circuit and said measuring means, and
a second valve for shutting off the supply of the hydraulic fluid to said drive means upon said platform attaining said predetermined position, and
compensating means connected to said hydraulic circuit to counteract said friction effects, and including
a hydraulic cylinder formed with an inner space, and
a piston movable within said inner space and dividing said inner space into two chambers, one of said chambers being subjected to said hydrostatic pressure, the other of said chambers being subject to said pump pressure,
whereby said friction effects are substantially counteracted upon said hydrostatic pressure equalling said pump pressure, so as to reach a state of balance in said hydraulic cylinder.

4,403,681

THREE DIRECTIONAL VIBRATION ISOLATOR

Rene A. Desjardins, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1980, Ser. No. 192,573
Int. Cl.³ F16F 7/10
U.S. Cl. 188—379 23 Claims



1. A vibration isolator for connecting a body to a vibrating mass with minimum transfer of vibration therebetween, comprising:
a first member connected to the body at two locations;
a second member connected to the vibrating mass at one location and to the first member at a plurality of locations; and
a plurality of inertia arms each connected to the first member and the second member, forming thereby all but one of the plurality of connections of the second member to the first member, whereby displacement of the second member in response to a vibratory force imposed by the vibrating mass produces a relative displacement of the first member and second member and a given displacement of the inertia arms in the direction of the second member which produces a net balancing force opposed to the vibratory force.

4,403,682

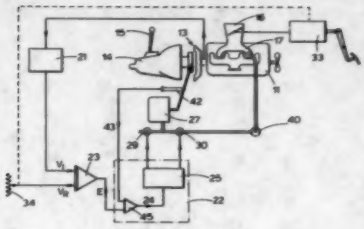
CLUTCH CONTROL APPARATUS

Peter J. Norris, St. Bees; Frederick J. Parker, Rugby, and Harry M. Windsor, Harbury Leamington Spa, all of England, assignors to Automotive Products Limited, Leamington Spa, England

Filed Feb. 18, 1981, Ser. No. 235,581
Claims priority, application United Kingdom, Feb. 18, 1980, 8005373
Int. Cl.³ B60K 41/02
U.S. Cl. 192—0.033 4 Claims

1. A vehicle transmission clutch control system comprising;
an engine speed sensor;
means for producing an engine speed signal derived from the engine speed sensor;
generator means for producing a reference signal;
first comparator means arranged to receive and compare said speed signal and the reference signal and produce a consequent error signal;
a clutch actuator for operating the clutch to vary the state of engagement of the clutch with the vehicle engine;
a clutch actuator control for controlling the clutch actuator;
a clutch position transducer connected to the clutch actuator

to produce a clutch position signal indicative of the state of engagement of the clutch; and



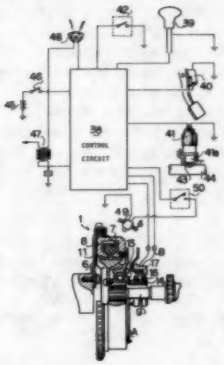
second comparator means arranged to receive and compare said error signal and the clutch position signal and produce a difference signal which is supplied to the actuator control.

4,403,683

ELECTRO-MAGNETIC POWDER CLUTCH SYSTEM FOR AUTOMOBILES

Toshio Takano, Hamuramachi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 195,897
Claims priority, application Japan, Oct. 22, 1979, 54-136560
Int. Cl.³ F16D *37/02*; B60K *41/02, 41/28*
U.S. Cl. 192—0.052 **7 Claims**



1. In a system for controlling an electro-magnetic clutch of an internal combustion engine for a vehicle, which has a drive member secured to a crankshaft of said internal combustion engine, a magnetizing coil provided in said drive member, and a driven member adjacent said drive member operatively connected to said drive member, and a transmission operatively connected to said driven member and having multi-stage change gears including at least first, second and third speed stages, the improvement comprising

a 2nd gear switch means for being operated by shifting the gears in said transmission to the second speed stage

a thermo switch means for being operated at a predetermined temperature of the clutch and connected to said 2nd gear switch means in series, and

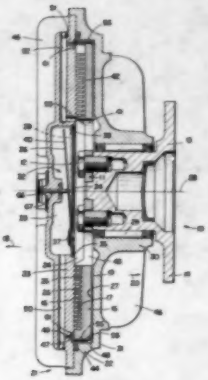
a warning means operatively connected to said 2nd gear switch means and said thermo switch means for being operated by a combination signal from said 2nd gear switch means and said thermo switch means.

4,403,684

FLUID SHEAR COUPLING APPARATUS

Paul J. Haeck, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,228
Int. Cl.³ F16D *33/12, 35/00, 43/25*
U.S. Cl. 192—58 B **18 Claims**



1. A fluid shear coupling apparatus which comprises:

a driving member including a disc-shaped portion having a front side and a rear side, the front side including a first shear surface;

a driven member defining a working chamber within which said driving member is received, said driven member including a first shear surface configured and positioned complementary to the first shear surface of said driving member to define a fluid shear chamber therebetween and cooperable with shear fluid in the fluid shear chamber to transmit torque between said driving member and said driven member;

mounting means for mounting said driven member to said driving member and rotatable about a common axis;

a shear fluid reservoir;

first flow means for providing flow of shear fluid from said reservoir to the working chamber and from the working chamber to said reservoir; and

second flow means, separate from the working chamber and said reservoir, for providing flow of shear fluid from a radially-outward location of the working chamber directly to a radially-inward location of the working chamber for permitting substantially continuous recirculation of shear fluid through the working chamber between the first and second locations, said second flow means including a passageway defined by said driven member and extending radially inward only to about the radially-innermost portion of the first shear surface, the passageway communicating with the fluid shear chamber and directing the recirculated shear fluid back into the fluid shear chamber at a location only as radially inward as about the radially-innermost portion of the first shear surface.

4,403,685

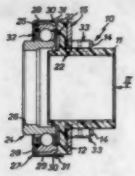
CLUTCH RELEASE BEARING

Carlo Beccaris, Santena, Italy, assignor to Valeo Societe Anonyme, Paris, France

Filed Dec. 29, 1980, Ser. No. 221,049
Int. Cl.³ F16D *23/14*
U.S. Cl. 192—98 **13 Claims**

1. A clutch release bearing comprising an operating element operable by a clutch control member, and a drive element actuable by said operating element and cooperable with a clutch release mechanism, said operating element comprising a

transverse annular flange, a bearing plate overlying said transverse annular flange for contact with the clutch control member, and clips having elastically deformable lateral wings with a bight portion therebetween for providing an elastic snap-fit



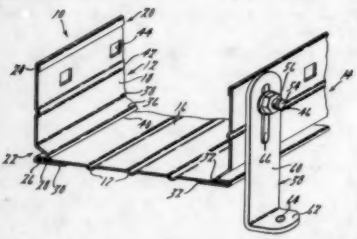
engagement of said clutch release bearing on the clutch control member, each of said clips defining an independent, generally U-shaped part, said bearing plate having lugs extending between said lateral wings of each respective clip and relatively adjacent said bight portion of each clip.

4,403,686

MODULAR CHUTE ASSEMBLY

Jacob L. Rycenga, 3285 Middlebury La., Birmingham, Mich. 48010

Filed Jun. 1, 1981, Ser. No. 268,690
Int. Cl.³ B65G *11/00*
U.S. Cl. 193—2 C **24 Claims**



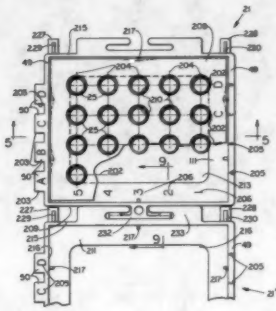
1. A three-piece modular chute assembly comprising a chute bottom and two chute sides, and chute sides each having a substantially flat body portion with an upper edge at one end and a lip means at the other end, said upper edge having a hem and said lip means including a recess that lies substantially perpendicular to said chute sides, said recess having a recess top and a recess bottom, said recess bottom extending inwardly from and perpendicular to said chute side and said recess top extending inwardly from said chute side and substantially parallel to said recess bottom, said recess bottom extending further inwardly than said recess top, said recess having a vertical width slightly larger than the vertical width of said chute bottom so as to integrally accommodate the edges of said chute bottom, wherein said chute sides and said chute bottom comprise a chute module, said modular chute assembly containing at least one chute module, and whereby said chute bottom and said chute sides are manufactured in varying standard widths and heights so as to be interchangeably combined into said chute module according to each user's chute requirements.

4,403,687

LINKABLE SAMPLE-TUBE CARRYING TRAY WITH TABS AND GEARS

William M. Stevens, Loveland, and Eugene L. Timperman, Cincinnati, both of Ohio, assignors to Randam Electronics, Inc., Cincinnati, Ohio

Filed Oct. 27, 1980, Ser. No. 201,190
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 **33 Claims**



1. A sample tray for use with an analytical instrument having detector means for performing an analysis upon a sample contained in a sample holder and conveyor means for imparting a force to said tray, in a predetermined direction, said tray comprising:

(A) retaining means for holding a plurality of said sample holders in rows and in a plane including said direction;

(B) conveyor cooperating means, couplable to said retaining means, for receiving said force of said conveyor means to move said retaining means in said direction; and

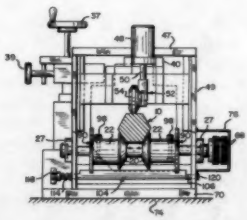
(C) machine-readable position-indicating means aside from printed alpha-numeric data, couplable to said retaining means and separate from said retaining means and from said conveyor cooperating means, for indicating to said instrument the location of the center of each of the rows.

4,403,688

TUBE OR BAR STOCK FEED SYSTEM

Michael R. Livia, Brooklyn; William S. Gould, Suffern, and Peter L. Suhr, Westbury, all of N.Y., assignors to Magnetic Analysis Corporation, Mt. Vernon, N.Y.

Filed May 6, 1981, Ser. No. 260,980
Int. Cl.³ B65G *13/02*
U.S. Cl. 198—785 **5 Claims**



1. An apparatus for transporting tube or bar stock in a direction along its longitudinal axis comprising:

(a) a series of drive assemblies aligned perpendicularly to said direction of transport, each drive assembly including:

(i) a driven shaft;

(ii) threaded portions of oppsite hands on said shaft dis-

posed on opposing portions of said shaft with respect to said axis;

(iii) a roller assembly of two coaxial frusto-conical rollers surrounding said shaft and engaging said threaded portions;

(iv) an inclined surface on each of said frusto-conical rollers configured to contact said tube or bar stock;

(v) means for rotationally connecting and disconnecting said rollers and said shaft including a housing configured to permit relative motion between said roller and said housing in the direction of said shaft, surrounding said driven shafts and rotationally engaging said rollers, and a series of electromagnetic clutches, one associated with each housing, said clutches configured to rotationally connect and disconnect said shaft and said housing;

(b) reversible drive means for rotating the driven shaft of each drive assembly in synchronism in a first direction or a second direction to transport said tube or bar stock when said shaft and said roller assemblies of each drive assembly are rotationally connected, and

(c) means for preventing the rotation of said rollers when said shaft is rotationally disconnected from said rollers whereby said rollers of each drive assembly synchronously travel toward one another on said threaded portions of opposite hands when said drive means is rotated in said first direction and synchronously travel away from one another when said drive means is rotated in said second direction.

4,403,689

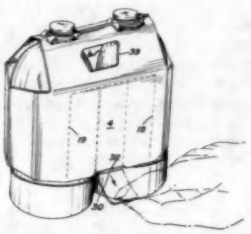
ARTICLE CARRIER

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 27, 1981, Ser. No. 325,501

Int. Cl.³ B65D *85/62*; B66C *1/10*; B65D *75/00*

U.S. Cl. 206—158 **11 Claims**



1. An article carrier comprising a pair of handle panels foldably joined along the upper edges thereof, a pair of side walls joined respectively to said handle panels along the lower portions thereof, a plurality of article receiving apertures formed in said handle panels and disposed astride the fold line between said handle panels, end wall panels joined respectively to the end edges of said side walls and extending generally inwardly of the carrier, and a glue flap joined to the inner edge of one of said end wall panels at each end of the carrier and being adhered in overlapping relation to the adjacent end wall panel.

4,403,690

SLIDE-UP HANDLE

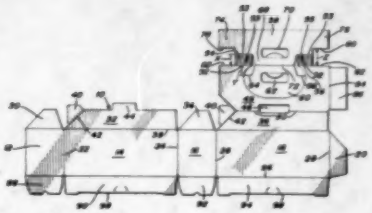
David Fischer, 12 Cavotti Crescent, Downsview, Ontario, Canada (M3H 4V1)

Filed Jan. 25, 1982, Ser. No. 342,213

Int. Cl.³ B65D *5/46, 75/00*

U.S. Cl. 206—163 **6 Claims**

1. A handle structure for application to cartons comprising a first panel, a handle cut in said first panel, said handle having a pair of shoulders extending laterally one from each side of said handle, a handle panel, means defining a second handle in said handle panel, the top edges of said handle and said second handle being connected by a fold line connection, connecting straps positioned one on each side of said second handle and foldably connected at one end to said handle panel and at its opposite end to said first panel by means of fold lines substantially parallel to said fold line connection, said straps being laterally spaced from said handle by a distance less than the distance said shoulders project laterally from said handle the



lengths of said straps between said fold lines connecting each said straps to said first panel and said handle panel and the distances between said shoulders and said fold lines connecting said straps to said first panel being substantially equal so that when said handle panel is folded into face-to-face relation with said first panel and said handle is moved to an extended position said shoulders are in a position to engage said connecting straps adjacent said fold lines connecting said straps to said handle panel.

4,403,691

SPARE LEAD HOLDER

Hidehei Kageyama, and Takahiko Suzuki, both of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Dec. 11, 1980, Ser. No. 215,312

Claims priority, application Japan, May 9, 1980, 55-063437; Nov. 12, 1980, 55-161706

Int. Cl.³ A45C *11/34*

U.S. Cl. 206—214 **9 Claims**

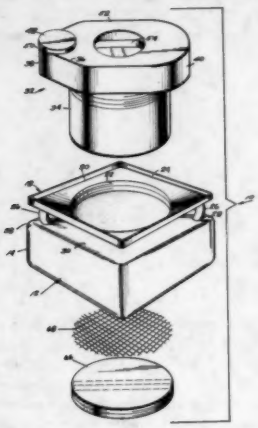
1. A spare lead holder which comprises a hollow cylindrical holder body for containing spare leads, said holder having an open end portion and having a longitudinal groove formed on the inner wall along the axial direction of said holder body for locating only a suitable number of leads to a position from which said leads are taken out, and a cap body frictionally and rotatably mounted on said one end portion of said holder body, said cap body having on the top surface thereof an opening for taking out said leads; said holder body and said cap body having means for limiting rotational motion of said cap body relative to said holder body in one direction of rotation of said cap body to a position in which said opening is aligned with said groove whereby only the spare leads within said groove are accessible through said opening.

4,403,692

MOTOR OIL CHANGE KIT

William F. Pollacco, 3819 Burlingame Pl., Alexandria, Va. 22309

Filed Aug. 27, 1981, Ser. No. 297,082
Int. Cl.³ B65B 39/00; F16N 31/00; B65D 81/36
U.S. Cl. 206—223 6 Claims



1. A motor oil change kit comprising: a jug of molded plastic material for initially containing a quantum of new oil sufficient to fill the engine oil reservoir of a motor vehicle internal combustion engine, said jug having at least one neck provided with a respective recloseable cap which at least one neck is located in the vicinity of the top of the jug when the jug is upright;

an outer container of molded plastic material, which initially receives and substantially encloses said jug, said outer container having a volumetric capacity at least as large as said quantum, and being capable of free-standing without need for being confined by a container box; and

securement means initially retaining said jug received within and substantially enclosed by said outer container;

said outer container initially completely enclosing said jug;

said outer container further including a lid which constitutes a front wall of said outer container when said jug is upright and which constitutes a top wall of said outer container when said outer container is disposed as a receiver for used oil;

said outer container having a body including an opposite wall from said lid and a peripheral wall perimetrically bounding said opposite wall; said perimetrical wall ending in a perimetrical lip distally of said opposite wall;

said lid including a perimetrical groove adapted to frictionally, removably securely receive said lip for removably sealingly securing said lid on said body of said outer container both when said jug is contained within said outer container and when said jug is outside said outer container and said outer container is full of used oil;

one said neck projecting vertically upwardly from said jug when said jug is upright;

said sidewall of said body of said outer container including means defining a pocket for receiving said one neck and the respective recloseable cap; and

said lid of said outer container including a corresponding appendage for covering said pocket, said lip extending around said pocket and said groove extending around said appendage.

2. A motor oil change kit comprising:

a jug of molded plastic material for initially containing a quantum of new oil sufficient to fill the engine oil reservoir of a motor vehicle internal combustion engine, said jug having at least one neck provided with a respective recloseable cap which at least one neck is located in the vicinity of the top of the jug when the jug is upright;

an outer container of molded plastic material, which initially receives and substantially encloses said jug, said outer container having a volumetric capacity at least as large as said quantum, and being capable of free-standing without need for being confined by a container box; and

securement means initially retaining said jug received within and substantially enclosed by said outer container;

said relcoseable cap for one said neck of said jug including, in addition to a cap end wall having a threaded skirt, an inner structure comprising a rod coaxially secured at one end thereof to and extending inwardly from said cap end wall and having a threaded plug disposed on the opposite end thereof;

said outer container including a body having an inner end wall adapted to function as a floor when said outer container is disposed in turkey roaster orientation for collecting and containing used oil, and a peripheral sidewall for perimetrically integrally joining said inner end wall and adapted to function as an upstanding sidewall when said outer container is disposed in said turkey roaster orientation;

means providing an internally threaded drain opening in said inner end wall, correspondingly threaded with said plug, so that said recloseable cap may be unthreaded from said jug and, after said jug is removed from said outer container, said plug may be threaded into said drain opening from within said outer container to removably stopper said drain opening and leave said recloseable cap projected substantially above said floor of said outer container;

said rod being of sufficient length that when said quantum of used oil has been drained into the outer container, said recloseable cap remains disposed above the used oil and free to be grasped and rotated for removing the plug from the drain opening; and

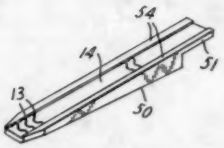
said jug and said outer container having cooperable surface means whereby said outer container, when stoppered and containing said quantum of used oil may be rested upon said jug with said drain opening, though stoppered by said plug, disposed in an open said neck of said jug, after said jug has been emptied of new oil, and said plug removed to allow the quantum of used oil to drain from said outer container into said jug, whereupon said jug may be reclosed using said recloseable cap.

4,403,693

MEDICAL STAPLING DEVICE

Harold E. Froehlich, St. Anthony, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 78,602, Sep. 24, 1979, Pat. No. 4,321,002, which is a division of Ser. No. 890,682, Mar. 27, 1978, Pat. No. 4,185,762. This application Feb. 16, 1982, Ser. No. 349,063
Int. Cl.³ B65D 83/02, 85/24; F15B 15/00; A43B 23/20
U.S. Cl. 206—339 3 Claims



1. A cartridge adapted for releasable engagement in a stapler, said cartridge comprising parallel elongate rails defining opposed parallel grooves; and a plurality of staples each having arcuate end portions in said grooves and frictionally engaged with said rails, said staples opening toward the same end of said cartridge, being disposed with the side surfaces of the staples in

common planes, and being in closely adjacent relationship along said grooves, and said cartridge having an opening between said rails on one side to afford access to the sides of said staples spaced along said rails.

4,403,694

GUIDE STRIP FOR CONVEYING FITTINGS INTO A STUDDING MACHINE

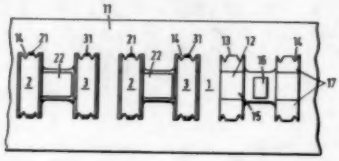
Karl E. Schmale, Lüdenscheid, Fed. Rep. of Germany, assignor to Schmale & Co., Lüdenscheid, Fed. Rep. of Germany

Continuation of Ser. No. 865,597, Dec. 28, 1977, abandoned. This application Oct. 2, 1980, Ser. No. 193,387

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659150

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—347 **11 Claims**



1. An assembly comprising a guide strip and a plurality of fittings carried by said strip, said assembly being provided for introduction into a studding machine in which each said fitting is separated from said strip and hammered into a box-shaped container, said guide strip comprising a tape-like foil presenting a succession of integral, conically tapered nests, each configured to conform to and retain a respective fitting, with said nests being spaced along said strip and all open to one face of said foil, and each said fitting being configured to be hammered into such a container and being releasably retained in a respective nest until being separated from said strip, and wherein each said nest includes holding means including a tongue disposed for holding a portion of the respective fitting in said nest.

4,403,695

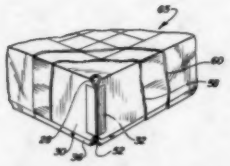
HEAT-SHRINKABLE FILM WRAPPED PACKAGING

Russell A. Raymoure, Olathe; Richard P. Bechtel, Jr., Prairie Village; Ray Carson, Shawnee, and Alva G. Don Carlos, Roeland Park, all of Kans., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Jan. 6, 1982, Ser. No. 337,497

Int. Cl.³ B65D *71/08, 85/00, 5/68*

U.S. Cl. 206—497 **12 Claims**



1. A carton for packaging articles formed of a rigid or semi-rigid material having a top and bottom and a plurality of sides disposed in angularly intersecting planes which define a plurality of angular corners and having at least a portion of the apex regions of said corners cut out to a size insufficient to disrupt continuity in lines of a heat-shrinkable overwrap applied to the carton whereby the carton is characterized by the absence of sharp points at the corners thereof and is adapted for overwrapping with a heat-shrinkable plastic film whereby the stress forces on the plastic film at all of the corners of the carton are reduced, comprising

a tray comprising

a bottom panel square or rectangular in shape,

upstanding side and end walls abutting with one another and engaged with the bottom panel at the edges thereof,

means securing the upstanding side and end walls in abutting relationship,

said tray having cut out portions at the corners thereof,

a cover comprising

a top panel structure similar in shape but somewhat larger than said bottom panel,

downturned side and end walls abutting with one another and engaged with the top panel at the edges thereof,

means securing the downturned side and end walls in abutting relationship,

said cover having cut out portions at the corners thereof.

4,403,696

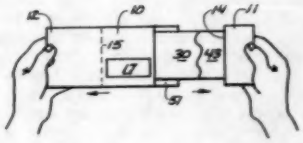
ENVELOPE

William C. Newell, Spokane, Wash., assignor to I-Tron, Inc., Spokane, Wash.

Filed Apr. 19, 1979, Ser. No. 31,503

Int. Cl.³ B65D *27/06, 27/34*

U.S. Cl. 206—623 **18 Claims**



1. A reusable stuffed envelope assembly for initial use in the delivery of an insert, comprising:

a front panel and a back panel overlying and secured to one another, the panels each having an inside surface and an outside surface;

a first tear line across the front panel;

a second tear line across the back panel;

the first tear line being spaced inwardly from one side edge of the envelope a distance greater than the distance between the second tear line and the one side edge of the envelope;

said first and second tear lines defining a removable portion of the envelope that includes said one side edge thereof and which is adapted to be grasped in pulling opposition to the opposite side edge of the envelope for bursting the envelope by separation of the removable portion from the remainder of the envelope along said first and second tear lines;

a primary insert sandwiched between the front and back panels adjacent the one side edge of the envelope, whereby the primary insert is grasped and removed from the envelope conjointly with separation of the removable portion of the envelope;

the back panel including a portion that extends outward from the first tear line after separation of the insert and the removable portion of the envelope from the remainder of the envelope, the extended portion of the back panel being foldable over the first tear line and front panel as a covering flap to enable the remainder of the envelope to be reusable;

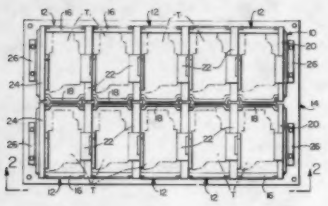
said front and back panels further including third and fourth tear lines respectively, said third and fourth tear lines being formed across the panels at positions intermediate the location of the first tear line and said opposite side edge of the envelope.

4,403,697

RACK CONSTRUCTION

David J. Forshee, 11 Misty Morning Dr., Hilton Head Island, S.C. 29928

Filed Dec. 29, 1980, Ser. No. 220,828
Int. Cl.³ F16M 11/00
U.S. Cl. 211—13 31 Claims



1. A cradle set for translating a load unit or subassembly from one station to another comprising

a pair of plastic unitary integrally molded grid-type end nest component members, each having laterally extending support ledges complementary to and with a selected end portion or portions of said load unit or subassembly to support and cradle the same, said end nest members being arranged in parallel opposedly facing relationship,

a pair of plastic unitary integrally molded separator and tieing members removably secured to respective opposedly facing ends of said end nest members,

a plastic unitary, integrally formed accessory strap component operatively engageable with at least one said end nest component member and said selected end portion or portions securing said load unit or subassembly in said cradle set during translation of said load unit,

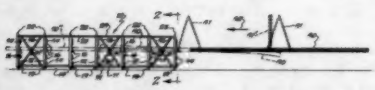
and fastener means removably securing said separator and tieing members to said end nest members.

4,403,698

ROD STORAGE RACK

Donald E. Care, Eden, and Edward L. Metzger, Angola, both of N.Y., assignors to E & D Specialty Stands, Inc., North Collins, N.Y.

Filed Apr. 20, 1981, Ser. No. 255,754
Int. Cl.³ E21B 19/14
U.S. Cl. 211—60 S 17 Claims



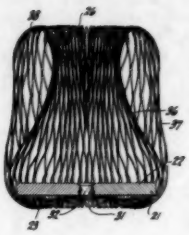
1. A rack for elongated rod-like members comprising a base, a plurality of frames mounted in aligned spaced relationship on said base, each of said frames comprising a plurality of vertical horizontally spaced columns, a plurality of horizontal vertically spaced beam-like members affixed to the columns of each of said frames to define openings in each of said frames with corresponding openings of all of said frames being in alignment, upper and lower biting edges on said beam-like members, rollers mounted on each of said frames behind each of said beam-like members with the upper portion of each of said rollers being slightly higher in elevation than the upper biting edge of the beam-like member adjacent thereto, and said lower biting edges being below said rollers, whereby said rod-like members will be carried by said rollers when said rod-like members are horizontal but will be bitingly engaged by the upper biting edge of one of said beam-like members of a frame at the end of said rack and the lower biting edge of another beam-like member at a higher elevation than the upper biting edge of said one of said beam-like members when the ends of said rod-like members outside of said rack tilt downwardly.

4,403,699

HOLDING DEVICE FOR PENCILS AND THE LIKE

Robert S. Hansen, 2 E St., Santa Rosa, Calif. 95404

Filed Feb. 2, 1978, Ser. No. 874,415
Int. Cl.³ A47F 7/00
U.S. Cl. 211—69.1 9 Claims



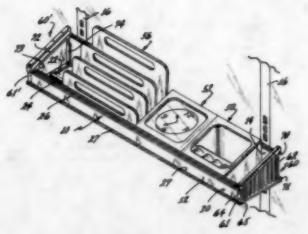
1. In a device for holding an elongated object: a generally planar base, an axially elongated tubing of flexible material folded back on itself to form inner and outer axially extending layers with a curved fold between the layers, and means including a plug mounted in a central bore in the base securing the ends of the tubing to the base with the axis of the tubing extending in a direction generally perpendicular to the plane of the base, said tubing comprising mesh of flexible strands joined together to form openings for receiving the elongated object in such a manner that the object extends through at least two of the openings and is gripped by the strands defining said openings, the mesh toward at least one end of the tubing being drawn together and secured in the bore by the plug.

4,403,700

MODULAR OFFICE ACCESSORY FOR PERSONAL ITEMS

Marvin D. Manlove, 6833 Oak Ter., Kansas City, Mo. 64113

Filed May 15, 1981, Ser. No. 263,775
Int. Cl.³ A47F 5/08
U.S. Cl. 211—88 8 Claims



1. As an article of manufacture, in combination, means forming an integral frame structure having ends constructed to support individual modular holders for office accessories, a plurality of individual holders forming modules constructed to be held in the frame structure, the frame structure having a flat bottom an open top to receive and hold the said modules, the said frame structure having a front wall and a back wall the front wall being lower then the back wall, the top edge of each wall forming a rail so as to provide a trackway, the modules each having an upper part having front and back portions formed to engage said rails to be slideable along the trackway,

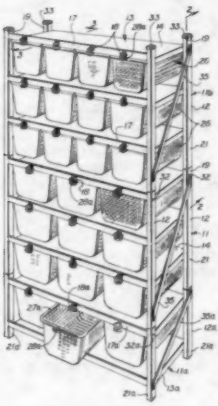
each of the modules being constructed to allow it to be manually removable and replaceable with respect to the frame structure, each individual module, having an office accessory carried by the said upper part within the said frame structure, the said frame structure being constructed so as to be adapted to be movably supported on a horizontal surface and having means for attachment to a vertical surface.

4,403,701

EXPANSIBLE RACK FOR LOCKER BASKETS AND GARMENT STORAGE

Patrick G. Corcoran, 3014 Rollison Rd., Redwood City, Calif. 94025

Filed Mar. 30, 1981, Ser. No. 249,080
Int. Cl.³ B01D *27/10*
U.S. Cl. 211—133 **4 Claims**



1. An extensible rack for locker baskets of the type having open tops defined by top boundary wires extending longitudinally of said baskets comprising a plurality of rectangular shelves horizontally spaced apart, vertical posts at the corners of said rack attached to said shelves, a plurality of guides fixed to the undersides of at least some of said shelves each said guide comprising a flat, horizontal central portion fixed to the underside of a shelf and on either longitudinal edge of said central portion a substantially vertical stretch extending downward and a substantially horizontal outwardly extending flange, said guides being spaced apart so that the two longitudinal top boundary wires of each of a plurality of baskets fit over opposed flanges and under the shelf to which said guides are fixed to restrain said baskets against horizontal transverse and vertical displacement, said flanges supporting said baskets spaced slightly above the shelf next below the shelf to which said guides are fixed, and cooperating locking means on said baskets and said shelves to restrain said baskets against horizontal longitudinal displacement.

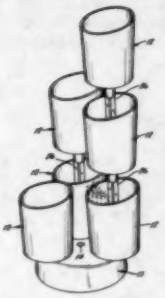
4,403,702

VARIABLE DISPLAY MERCHANDISING RACK

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

Filed Sep. 18, 1980, Ser. No. 188,334
Int. Cl.³ A47F *5/04*
U.S. Cl. 211—189 **1 Claim**

1. A knock-down display rack assembly for displaying articles at a point a purchase and which includes a base having a plurality of center posts, each of said center posts comprising a pair of elongated and axially outwardly-opening sockets, said center post further comprising a cross-member, the ends of said cross-member being connected to said sockets, a plurality of containers each having an inclined open upper end and also having a bottom, said inclined open upper end presenting a lower edge for good accessibility of said articles displayed therein, said container further having an integrally formed center post receiving member in its bottom with an upper and lower end and for detachable telescoping engagement with said sockets of said center posts whereby said containers can be stacked vertically on one another, said lower end of said center post receiving member being insertable in said recesses in said



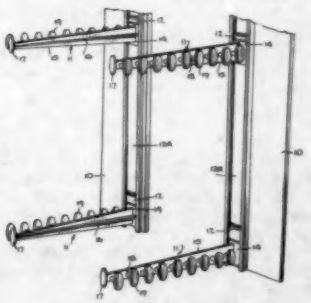
base so as to provide a plurality of stacks of containers on a single base, said center posts being quickly and easily removable from said upper ends of said center post receiving members by simple upward movement of said center posts, said center posts further being of a length sufficient to permit simultaneous customer access to said open ends of any of said vertically stacked containers, and said containers being transparent and being molded in one piece and of a plastic material.

4,403,703

GARMENT DISPLAY AND STORAGE UNIT

Walter G. Nikles, Jr., 210 Shore Rd., Long Beach, N.Y. 11561

Filed Feb. 5, 1981, Ser. No. 231,901
Int. Cl.³ A47G *29/02*
U.S. Cl. 211—193 **13 Claims**



1. A display and storage unit for garments having shoulder straps as well as garments having shouldered sleeves, the unit comprising:

A. at least one supporting beam having a longitudinally-extending channel on its front face; and

B. a plurality of modules, each constituted by a square plate receivable in said channel and an arm cantilevered from the plate, the arm being provided with a series of hooking posts which, when the plate is oriented in the channel so that the posts extend horizontally, function as hooks to engage the strap loops of garments having shoulder straps; and when the plate is oriented in the channel so that the

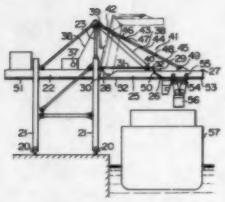
posts are upright, the posts then define a series of stations to hold the hooks of conventional clothes hangers carrying garments having shouldered sleeves.

4,403,704

VERTICALLY PIVOTABLE BOOM BENDING DEVICE FOR CRANE

Kazuhiro Makino, Kudamatsu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,470
Claims priority, application Japan, Apr. 8, 1981, 56-51781
Int. Cl.³ B66C *23/82*
U.S. Cl. 212—262 **4 Claims**



1. In a crane comprising a main boom, a vertically pivotable boom comprising an inner boom section connected to the outer end of the main boom for vertical pivotal movement and an outer boom section connected to the outer end of the inner boom section for vertical pivotal movement, an articulating rope extending from a main body of the crane to the inner boom section, a rope winding system for paying out and gathering in the articulating rope and first tension means connecting the main body of the crane to the outer boom section, a vertically pivotable boom bending device comprising:

second tension means connected at one end thereof to the main body of the crane for pivotal movement in a vertical plane and at the other end thereof to the outer boom section for pivotal movement in a vertical plane, wherein a point of connection of the inner boom section to the main boom of the crane, a point of connection of the inner boom section to the outer boom section, a point of connection of the second tension means to the main body of the crane and a point of connection of the second tension means to the outer boom section are located such that imaginary lines connecting these points of connection together form a substantial parallelogram.

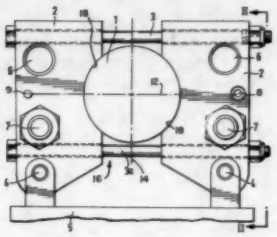
4,403,705

SHORT COUPLING FOR RAIL VEHICLES

Dieter Ernst; Hilmar Forster; Wilhelm Günther, all of Wolfenbüttel, and Ernst Vahldiek, Beierstedt, all of Fed. Rep. of Germany, assignors to Scharfenbergkupplung GmbH, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 155,164
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922439
Int. Cl.³ B61G *5/06*
U.S. Cl. 213—1.3 **4 Claims**

1. In an arrangement for a short coupling for rail vehicles, the short coupling having an end face and being of the type having guide means for supporting an axially displaceable electrical line coupling, and support means for both a centering pin and a bore for receiving the centering pin of a counter-coupling to be engaged therewith, and a bore for receiving a fixed pneumatic line coupling, the improvement in which said support means comprises two plates, each of said plates being shaped and disposed in mirror-symmetrical relationship relative to a vertical median plane extending through the short coupling, with a gap between said plates, said plates each having a recessed bearing face with a contour matching an outer contour of the short coupling, a screw bolt extending horizontally through said two plates above and below the short coupling and bridging said gap for detachably connecting each of said plates to each other and to the short coupling with each bearing face engaging the short coupling, said two plates offset axially rearwardly with respect to the end face,



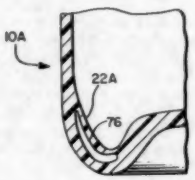
the centering pin of the short coupling being mounted on said support means and said support means including the bore for receiving the centering pin of a counter-coupling and for receiving the fixed pneumatic line coupling, and wherein said support means includes means for guiding the axially displaceable electrical line coupling.

4,403,706

PLASTIC CONTAINER WITH HOLLOW INTERNAL RIB REINFORCED BOTTOM AND METHOD OF FORMING THE SAME

Gautam K. Mahajan, Stamford, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Jun. 8, 1982, Ser. No. 386,378
Int. Cl.³ B65D *1/02, 23/00, 1/40*
U.S. Cl. 215—1 C **19 Claims**



8. A blow molded plastic material beverage bottle having a reversely turned bottom of the champagne type, said bottle including a body terminating at its lower end in a radially inwardly curved upper bottom portion which terminates in turn in a reversely turned annular base portion, and said bottom inwardly of said base portion being inverted and of a generally frustoconical configuration, said bottom being reinforced by radiating ribs disposed internally of said bottle and extending across said base portion, said ribs being tubular.

4,403,707

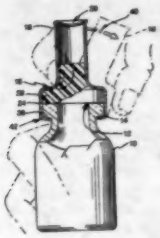
COMBINATION CONTAINER CAP AND CLOSURE SEAL

John T. Connor, Norristown, Pa., assignor to The West Company, Phoenixville, Pa.

Filed Nov. 12, 1981, Ser. No. 320,579
Int. Cl.³ B65D *41/42*
U.S. Cl. 215—253 **10 Claims**

1. A combination cap and container closure and sealing means, adapted for operative connection to a container having an access opening, to seal the contents therein, said cap comprising an elongated, exterior top portion, and a bottom, open-

ended skirt operatively integrated therewith, said skirt having a lower edge removably attachable to said container about said access opening, said combination cap and closure sealing means being conjointly operatively connectable to and removable from said container as an integrated unit to open the container for access to material therein, by application of a lateral tilting force against the elongated cap exterior portion



at a position thereof remote from connection of the cap to the container, said sealing means comprising a resilient material integrated with the cap interior and disposed within the interior of at least said skirt portion and extending into a portion of said elongated exterior top portion of said cap and being sealingly engaged with and about said access opening with said cap operatively mounted on said container.

4,403,708

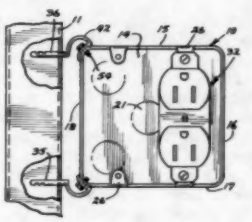
ELECTRICAL RECEPTACLE BOX ASSEMBLY

Robert A. Smolik, 670 W. Seventh St., St. Paul, Minn. 55102

Filed Jul. 19, 1982, Ser. No. 399,473

Int. Cl.³ H02G 3/10

U.S. Cl. 220—3.5 **21 Claims**



1. An electrical receptacle box assembly comprising:

a box-like housing for accommodation of an electrical receptacle;

a metal wall stud of the type for use in building construction with a major side member having a plurality of mounting holes describing a hole pattern;

a plurality of resilient tines mounted on the exterior of the housing, each having a linear tine portion outwardly extended from the housing, said linear tine portions being substantially parallel to each other, each tine at an opposite end having a spring loop portion fixed to the housing permitting resilient deflection of the linear tine portion with respect to the housing;

the outer ends of the linear tine portions of said tines being arranged to describe a pattern generally corresponding to, but slightly deviant from, the hole pattern on the wall stud whereby the tines are insertable into corresponding holes under slight spring deflection to mount the housing with respect to the wall stud; and

each linear tine portion having at least one transverse notch positioned for engagement with the edge of a mounting hole upon insertion of the tines into the mounting holes.

4,403,709

DRINKING AND POURING AID FOR CONTAINERS OF BEVERAGES AND OTHER LIQUIDS

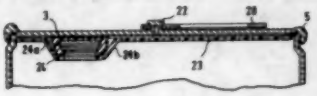
Wolfgang Meins, Aisterredder 44, D-2000 Hamburg 65, Fed. Rep. of Germany; Jürgen Stoldt, Ahrensburg, and Peter Rose, Henstedt-Ulzburg, both of Fed. Rep. of Germany, assignors to Wolfgang Meins, Hamburg, Fed. Rep. of Germany

Filed May 12, 1980, Ser. No. 148,727

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920159

Int. Cl.³ A47G 19/22

U.S. Cl. 220—90.4 **3 Claims**



1. A drinking spout arrangement for use with a beverage container having a cover secured to the top of the container wherein the cover has a removable area defined by a frangible seam and connected to a pull tab which removable area creates an opening through the cover when the tab is pulled, the drinking spout arrangement comprising:

a web of elastic material disposed within the container in juxtposition with the cover and being coextensive with the cover to enclose and seal the top of the can, and

a resilient spout formed integrally with the web and aligned with the removable area of the cover, the spout being in abutment with the removable area, the spout including a flange portion and a collapsible neck portion with the flange portion connecting the collapsible neck portion to the web; the spout having a cross-section defining an area substantially less than the removable area of the opening whereby when the opening through the cover is created by pulling the tab to discard the removable area, the spout springs beyond the cover and a portion of the web is exposed which is spaced from the spout, the exposed portion of the web having a vent hole therein spaced from the spout and communicating with the interior of the container;

the spout further including a top surface having a slit therein which slit is opened upon squeezing the spout with the mouth to drain the beverage from the container.

4,403,710

EASILY-OPENABLE HEAT SEAL LID

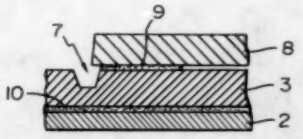
Kazumi Hirota, Tokyo; Yotaro Tsutsumi, Yokohama; Senji Ito, Ayase; Tadahiko Katsura, Yokohama; Kikuo Matsuoka, Yokohama, and Ichiro Hori, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed May 11, 1982, Ser. No. 376,949

Claims priority, application Japan, May 13, 1981, 56-70783; Apr. 8, 1982, 57-57273; Apr. 22, 1982, 57-66373

Int. Cl.³ B65D 17/34

U.S. Cl. 220—270 **12 Claims**



1. An easily openable heat seal lid for sealing a vessel proper by forming a heat-sealed portion between the lid and the vessel proper, which comprises a laminate comprising at least an

inner face member composed of a thermoplastic resin and a metal foil, wherein scores defining a portion to be opened are formed on the side inner than the portion to be heat-sealed so that the scores extend to the midway of the thickness direction of the metal foil, and said inner face member comprises at least one heat-selable thermoplastic resin layer having an adhesion strength of at least 800 g/15 mm to the metal foil, a tear strength lower than 3.0 Kg and a tensile modulus of at least 300 Kg/cm^2.

4,403,711

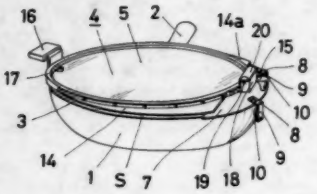
OIL SPLASH AND FIRE-PROOF LID

Kato Kyosuke, 58-22, 4-chome, Onomachi, Kasugai City, Aichi Prefecture, Japan

Filed Nov. 23, 1981, Ser. No. 324,014

Int. Cl.³ B65D *43/24*

U.S. Cl. 220—335 **1 Claim**



1. An oil splash and fire-proof lid arrangement that can be detachably mounted on the side of a shallow cooking or frying pan, which arrangement comprises:

(a) a bearing plate having an outer arcuate edge portion that approximates a portion of the outer periphery of the pan,

(b) means for detachably mounting said bearing plate on the side of the pan so that the bearing plate will be disposed parallel to the bottom of the pan regardless of the position of the lid,

(c) a lid member pivotally attached to said bearing plate by a pivotal mounting member so that said lid member can be pivoted from a lowermost position that is approximately parallel to the bottom of the pan to a raised position which permits access to the contents of the pan, said lid member comprising see-through, heat-resistant material, and

(d) means on said lid member for establishing a ventilating gap between the lid member and the upper rim of the pan when said lid member is pivoted downwardly to its lowermost position.

4,403,712

SNAP HINGE OF PLASTIC MATERIAL

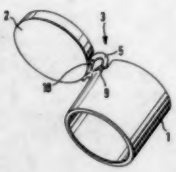
Wilhelm Wiesinger, Koechlistrasse 2, CH-8004, Zurich, Switzerland

Filed Jan. 21, 1982, Ser. No. 341,208

Claims priority, application Switzerland, Jan. 21, 1981, 360/81

Int. Cl.³ B65D *43/14, 51/04*

U.S. Cl. 220—339 **25 Claims**



1. An integral snap hinge of plastic material, comprising:

two hinge members adapted to be folded about a main geometric axis and being flexibly interconnected by at least one connecting element, the hinge members being flexibly interconnected at at least one additional place along the main geometric axis;

film hinges having the connecting element interposed therebetween, the film hinges being divergent and at least one being inclined with respect to the main geometric axis: and

at least one component of the snap hinge being resilient to perform the snap action.

4,403,713

DISTRIBUTING DEVICE FOR SO-CALLED SINGLE-SEED SEED DRILLS AND SEED DRILL COMPRISING SUCH A DEVICE

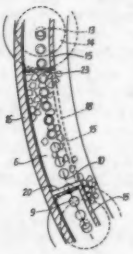
Paul Herriau, Cambrai, France, assignor to Societe SOGEFINA Societe de Gestion Financiere Armoricaine, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,367

Claims priority, application France, Mar. 31, 1980, 80 07190; Aug. 13, 1980, 80 17894; Feb. 19, 1981, 81 03317

Int. Cl.³ A01C *7/04*

U.S. Cl. 221—265 **14 Claims**



1. In a distribution device for single-seed seed drills of the type comprising a rotatable plate **5** having a peripheral edge **6**, a central portion onto which are fed the seeds, and a substantially vertical axis of rotation, the peripheral edge having recesses **9** substantially parallel to the axis of rotation and regularly spaced angularly about a circle **10** of said edge, the horizontal section of these recesses and the thickness of the edge corresponding substantially to the size of a seed said peripheral edge moving above a fixed support **11** in which are provided, directly below the recesses **9** of the rotatable plate, openings **13** for communication with a transport device **14**, and barrier means **22, 23, 50** upstream of each opening of the fixed support to deflect seeds not engaged in the recesses of the rotatable plate; the improvement comprising brake means **18, 39, 52** for retarding the outflow of seeds, said brake means being interposed between the central portion of the rotatable plate onto which are fed the seeds, and the barrier means **22, 23, 50**.

4,403,714

COLLAPSIBLE TUBE COMPRESSING PASTE DISPENSER

David M. Kane, 1238 Goldenrod Dr., Garland, Tex. 75043

Filed Dec. 10, 1981, Ser. No. 329,305

Int. Cl.³ B65D *35/28*

U.S. Cl. 222—101 **1 Claim**

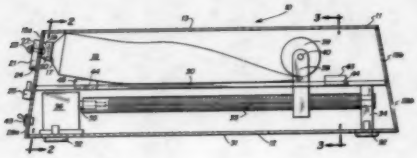
1. A collapsible tube compressing paste dispenser, comprising, in combination:

(a) two pairs of opposed walls affixed one to another and to a slotted platen, said walls also being rigidly affixed to a baseplate, thereby forming an enclosure having two ends, two sides, a top being said platen and a bottom being said baseplate;

(b) a tube compressing roller, rotatably mounted between

upper ends of two upright support members projected above the platen through two parallel slots so that the support members can travel longitudinally within the slots, and an internally threaded crossmember positioned below the slotted platen and having an end affixed to a lower end of one upright support member and an opposite end affixed to a lower end of the other upright support member, thereby forming a carriage for said roller;

(c) a single lead screw threaded through a threaded hole through said crossmember, supported at an end by a bearing means and supported at an opposite end by an output shaft of an electric gearmotor mounted within said enclosure, with said lead screw directly connected co-axially to the shaft of said gearmotor;



(d) a switch means interposed in an electric power supply wire means between an external electric power source and said gearmotor for actuation of said gear-motor and a second switch means connected to the supply wiring and to said gearmotor for reversing polarity and rotation of the gearmotor;

(e) a dispenser cover having a top wall affixed to a pair of opposed cover side walls and to a pair of opposed cover end walls, a circular hole through a first of said cover end walls sized to tightly fit around a cylindrical nozzle end of a dispensing adapter piece with thread means within a hole through said adapter piece;

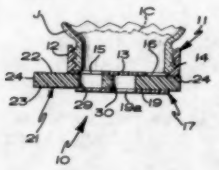
(f) a switch actuation and dispensing adapter nozzle closure lever pivotally mounted on a spindle affixed to said first cover end wall 15*a* and having a return spring means mounted on said spindle in association with said lever.

4,403,715

DEVICE FOR DISPENSING A MEASURED AMOUNT OF A PARTICULATE MATERIAL

Anthony W. Ladovissie, 1639 E. Constance Dr., Golden Valley, Minn. 55422

Filed Jun. 29, 1981, Ser. No. 278,685
Int. Cl.³ G01F *11/18*
U.S. Cl. 222—361 **1 Claim**



1. A particulate dispensing device, comprising:

a mounting member having an annular wall and having a flat, circular wall, said annular wall having means on the inner surface thereof adapted to engage the external means on the upper end of a conventional jar containing a particulate material such as instant coffee, said end wall having a pair of spaced apart similar openings therethrough;

a guide structure including opposed spaced apart sidde walls integral with said end wall of said mounting member, a substantially flat bottom wall integral with said side walls and spaced from said end wall of the mounting member, said bottom wall having a centrally located opening therethrough corresponding in size and shape to each opening in the end wall;

an elongated, generally rectangular shaped slide dispenser having side edges, substantially flat upper and lower surfaces, and end edges, said slide dispenser having a pair of spaced apart similar openings therethrough each corresponding in shape and size to the openings in said end and bottom walls, said slide dispenser being slidable in opposite directions in said guide structure, means on said slide dispenser engaging said guide structure to limit sliding movement of said slide dispenser in either direction, said slide dispenser when slid the limit of movement in either direction intercommunicating the other opening in the slide dispenser with the opening in the bottom wall of the guide structure whereby when the slide dispenser is shifted in either direction throughout its extent of movement, a predetermined amount of particulate material will be dispensed; and

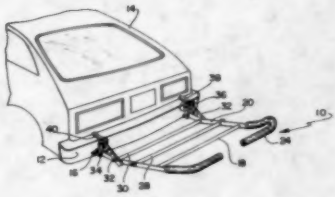
means on one end of said slide dispenser being shiftable to permit said slide dispenser to be removed from said guide structure, said shiftable means at one end of said slide dispenser comprising a pair of fingers each having a top element thereon for limiting movement of the slide dispenser in one direction, said fingers being movable toward each other to permit said slide dispenser to be removed from said guide structure.

4,403,716

AUTOMOBILE SUPPORT RACK

Gerald I. Carlson, 10 Paquin Rd., Barrington, R.I. 02806, and Norman J. Cook, 91 River Vue Ave., Warwick, R.I. 02889

Filed May 26, 1982, Ser. No. 382,129
Int. Cl.³ B60R *9/06*
U.S. Cl. 224—42.08 **10 Claims**



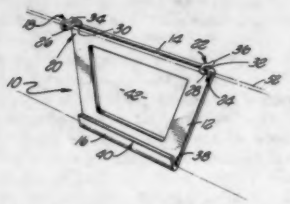
1. A multi-purpose support rack adapted for operative positioning at an end of an automobile and including means for positioning said rack thereat, said rack further including a frame comprising a pair of laterally separated posts pivotally connected at their inner ends to said positioning means and interconnected to each other by laterally extending crossmembers and a pair of essentially L-shaped handle members supported at the other ends of said posts for at least limited rotational movement with respect to said posts, said frame pivotally movable with respect to said positioning means between a first, upright, substantially vertical position where said handle members may be rotated to a rearwardly extending position normal to the plane of said frame for support of a bicycle and the like to a second substantially horizontal position where said frame extends outwardly from an end of said automobile for support of luggage and the like.

4,403,717

CAMERA CARRYING DEVICE

Betty L. Glover, 3132 Silverado Dr., Los Angeles, Calif. 90039

Filed Jan. 22, 1982, Ser. No. 341,931
Int. Cl.³ A45F 5/02
U.S. Cl. 224—252 6 Claims



1. A camera carrying device for attaching a camera having a pair of strap attachment rings on each side of the camera, to a belt or strap worn by a user, the camera carry device comprising:

a rigid body having an upper edge, a lower edge portion generally parallel to the upper edge and a pair of corner regions along the upper edge;

a pair of hook clips each extending from one of the corner regions, each hook clip for being clipped to one of the strap attachment rings on the camera; and

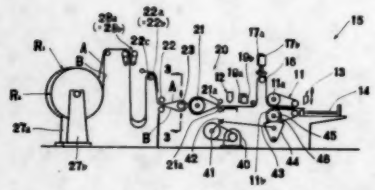
an upwardly directed reverse hook portion extending along the length of the lower edge portion for securing and holding the camera carry device with attached camera around the edge of the belt or strap of the user.

4,403,718

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING TRAVEL OF TWO PLASTICS FILM STRIPS AS A BAG MATERIAL OR THE LIKE

Mitsuo Nagano, Kawanoe, Japan, assignor to Taiyo Shokai Co., Ltd., Japan

Filed Oct. 16, 1981, Ser. No. 312,132
Claims priority, application Japan, Oct. 17, 1980, 55-144368
Int. Cl.³ B65H 23/00, 23/10, 23/04
U.S. Cl. 226—27 3 Claims



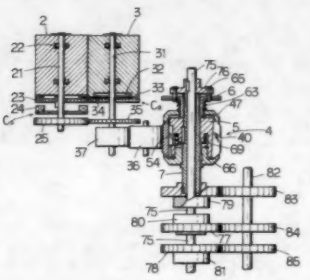
1. A method of automatically controlling travel of two transversely spaced parallel plastics film strips in a bag-making machine, packaging machine or the like, which comprises the steps of: moving the film strips, each having register marks at substantially regular intervals, by an intermittently operated conveyor means having a pair of nipping rollers; detecting the marks of the strips respectively by separate photoelectric detectors; and retarding either one of the strips that precedes the other strip during the next feeding action of said conveyor means by means of a first retarding device for the strip which is arranged to be operated in response to detection by one of said detectors of one of the marks of the strip, characterized in that in case where one of the marks of the other strip has not been detected by the other of said detectors within a predetermined time, after detection of one of the marks of the preceding strip, during each intermittent travel of the strips, retarding further the preceding strips and at the same time accelerating the other strip by means of a second retarding device for the strips.

4,403,719

TAPE FEEDING SYSTEM

Kyoichi Yamashita, Yokohama, Japan, assignor to Koyo-Jido-Ki Co., Ltd., Japan

Filed Jun. 24, 1981, Ser. No. 276,803
Claims priority, application Japan, Jul. 25, 1980, 55-101242
Int. Cl.³ B65H 17/22
U.S. Cl. 226—188 6 Claims



1. A tape feeding system comprising:

a larger drum and a smaller drum having greater and lesser circumferences than a predetermined length, respectively, and disposed in tangential contact for transporting tape therebetween;

a variable-diameter drum adapted to rotate at a constant speed;

transmission means for selectively connecting said variable-diameter drum to either one of said larger and smaller drums; and

control means for controlling said variable-diameter drum and said transmission means and capable of detecting whether the tape is overfed or underfed, whereby the diameter of said variable-diameter drum is reduced and the rotation of said larger drum depends on said smaller drum when said control means detects that the tape being transported between said larger and smaller drums is overfed, while the diameter of said variable-diameter drum is increased and the rotation of said smaller drum depends upon said larger drum when said control means detects that the tape is underfed.

4,403,720

BIDIRECTIONAL TAPE ADVANCING METHOD AND APPARATUS

Frederic F. Grant, Bellflower, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 5, 1982, Ser. No. 345,971
Int. Cl.³ B65H 59/38; G03B 1/04; G11B 15/32
U.S. Cl. 226—190 14 Claims

8. Apparatus for guiding an advancing tape in either one of two opposite directions, comprising in combination:

a hollow tape guide member;

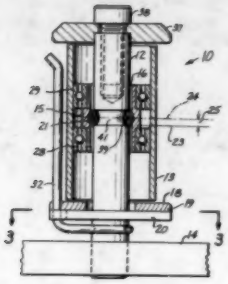
a post through said hollow tape guide member;

a sleeve around said post inside said hollow tape guide member;

a tape guide surface at an end of said tape guide member peripherally thereof and at an angle thereto;

means for supporting said sleeve for omnidirectional tilting motion relative to a plane intersecting said post at a predetermined location offset in a direction away from said tape guide surface from a central location corresponding to a longitudinal center line of said tape, including means for

providing a fulcrum circumferentially around said post at said offset predetermined location; and



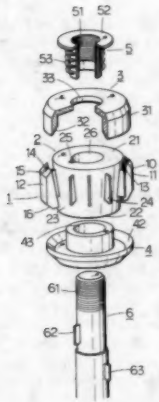
means for mounting said hollow tape guide member on said sleeve, including spaced bearings located at opposite sides of said plane.

4,403,721

VARIABLE DIAMETER DRUM

Kyoichi Yamashita, 2361 Nippa-cho, Kohoku-ku, Yokohama-shi, Kanagawa 223, Japan

Filed Jun. 5, 1981, Ser. No. 270,979
Int. Cl.³ B65H *17/20*; B23B *31/40*
U.S. Cl. 226—191 **6 Claims**



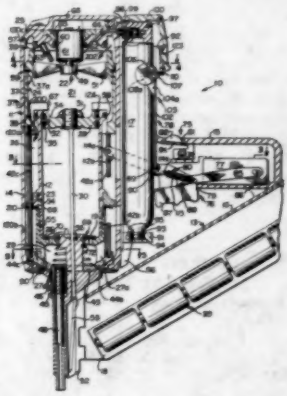
1. A variable diameter drum comprising:
a rotating shaft;
a plurality of separate cylinder segments circumferentially arranged around the shaft and each having an outer arc surface and outwardly beveled upper and lower surfaces such that lines extended parallel to said upper and lower surfaces would meet above said outer arc surface, the outer arc surfaces of said cylinder segments forming a substantially continuous cylindrical surface when said cylinder segments are joined together;
means for holding said cylinder segments, but allowing said cylinder segments to translate in their radial directions, said holding means including a lower ring secured to the shaft and an upper ring mounted for axial motion on the shaft and biased toward the lower ring, said cylinder segments being interposed between the lower and upper rings, said lower ring having an inwardly bevelled upper surface mating with said outwardly bevelled lower surfaces of said cylinder segments, and said upper ring having an inwardly bevelled lower surface mating with said outwardly bevelled upper surfaces of said cylinder segments; and
means for adjusting the position of said cylinder segments in their radial directions.

4,403,722

COMBUSTION GAS POWERED FASTENER DRIVING TOOL

Milovan Nikolich, Chicago, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jan. 22, 1981, Ser. No. 227,194
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—8 **29 Claims**



1. A portable fastener driving tool comprising a housing, a cylinder in said housing, a piston in said cylinder and movable through a driving stroke from a driving to a driven position, a driver attached to said piston, a magazine for supplying fasteners into position to be driven by said driver, a combustion chamber formed within said housing and having said piston as one wall thereof, a fan in said combustion chamber and controls therefor to operate same to cause turbulence in said chamber, main valve means controlling the flow of air into said combustion chamber and the exhausting of the gases of combustion from said combustion chamber, means for providing fuel into said combustion chamber and igniting same for driving said piston from said driving position to said drive position to drive a fastener, and means for returning the piston to the driving position after a fastener has been driven.

4,403,723

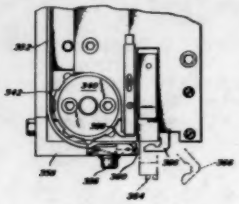
SEQUENCER LOADING HEAD FOR HIGH SPEED RADIAL LEAD COMPONENT SEQUENCING AND INSERTING MACHINE

Weibley J. Dean; David L. Merithew, and Phillip A. Ragard, all of Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,302
Int. Cl.³ B25B *5/08*
U.S. Cl. 227—76 **11 Claims**

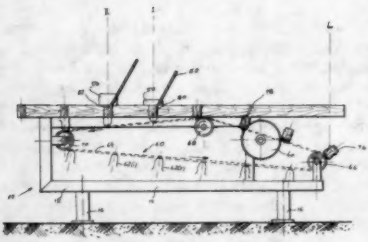
1. An apparatus for transferring electronic components supplied on a substrate having a series of components attached thereto, and for loading selected components having at least one lead onto a conveyor in a preferred sequence, said conveyor having clip carriers for positive clamping of and transporting of said components by at least one lead, said apparatus comprising:

a main housing;
feed means for feeding said substrate attached components to a load position;
indexing means for incremental actuation of said feed means to present said components to said load position one at a time;



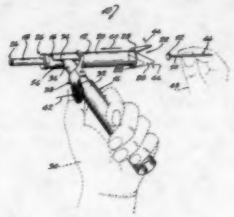
cutter means for severing said substrate between individual components to form severed components;
driver means for driving each of said severed components from said load position into a clip carrier upon command, such that said severed component is loaded into positive engagement with a clip carrier and clamped by said clip carrier.

4,403,724
AUTOMATED WALL PANEL FRAME MANUFACTURING APPARATUS
Albert Bardenstein, Syracuse, N.Y., assignor to Irwin J. Berlin, Venice Center, N.Y.
Filed Apr. 9, 1981, Ser. No. 252,414
Int. Cl.³ B27F 7/02
U.S. Cl. 227—76 **4 Claims**



1. An apparatus for manufacturing wall panel frames comprising:
a frame;
means including a top surface of said frame for receiving a first plate;
means including a top surface of said frame for receiving a second plate parallel to and spaced apart from the first plate;
a conveyor extending between said first and second plate receiving means for delivering spaced apart studs between said plates, said conveyor following a continuous path from below said top surface, substantially to said top surface, and then returning below said top surface;
a saw positioned along said conveyor upstream of said first and second plate receiving means for cutting each of the studs delivered by the conveyor to a length equal to the spacing between said plates, said saw being upstream of where said conveyor reaches said top surface;
an automatic nailing device secured to said frame along said conveyor downstream of where the conveyor reaches the top surface and adapted to nail said studs to said plates when said studs are properly positioned between said plates; and,
releasable stud engaging means on said conveyor, said stud engaging means being adapted to release after a stud has passed said nailing device whereby said conveyor also moves said plates and the attached studs.

4,403,725
NAIL HOLDING AND DIRECTING DEVICE
Noel A. Lawrence, 5980 Bienville, Brossard, Quebec, Canada
Filed Mar. 6, 1981, Ser. No. 241,009
Int. Cl.³ B25C 3/00, 9/00
U.S. Cl. 227—147 **10 Claims**



1. A nail holding and directing device comprising:
a handle;
an elongated member connected to said handle, said member having a longitudinally extending bore into which an end portion of said nail may be coaxially inserted at one end of said member;
a striker rod slidably mounted in said bore for reciprocating movement therein, said rod having an outer end extending beyond the other end of said member and an inner end adapted to abut against said end portion of said nail;
a sleeve slidably mounted on said member for movement towards and away from said one end of said member;
at least two gripping fingers each pivotally mounted on a respective hinge provided on one end of said sleeve adjacent said one end of said member, whereby said gripping fingers are pivotally movable relative to said sleeve between open and closed positions so as to respectively release and slidably hold said nail between its ends while guiding same when a striking force is applied to said outer end of said striker rod for forcing said nail out of said bore and into said structure, each said gripping finger being provided adjacent its respective hinge with a respective inner cam surface for frictional engagement with an end edge of said member at said one end thereof so as to cause each finger to pivotally move towards said open position when said sleeve is moved away from said one end of said member;
biasing means normally urging each said gripping finger towards said closed position;
further biasing means normally urging said sleeve towards said one end of said member;
stop means for preventing said sleeve from moving beyond said one end of said member;
a pair of opposed lever arms pivotally mounted on said handle for pivotal movement between first and second positions, said lever arms having the free ends thereof straddling said sleeve and connected thereto for moving said sleeve away from said one end of said member against the pushing force exerted by said further biasing means towards said one end when said lever arms are moved towards said second position, said lever arms being normally urged through said connection towards said first position by said further biasing means; and
a finger actuated element connected to said lever arms for pivotally moving same towards said second position, thereby moving said sleeve away from said one end of said

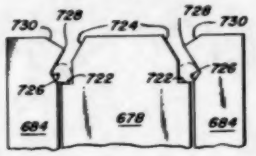
member and causing each said gripping finger to move to said open position against the closing force exerted by said biasing means.

4,403,726

INSERTION HEAD FOR HIGH SPEED RADIAL LEAD COMPONENT SEQUENCING AND INSERTING MACHINE

Michael D. Snyder, Binghamton, N.Y., and Crawford A. Matson, Wyalusing, Pa., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Apr. 18, 1980, Ser. No. 141,608
Int. Cl.³ B25B 5/08
U.S. Cl. 227—149 **8 Claims**



1. In an apparatus for cyclical insertion of radial leads of electronic components into the holes of a printed circuit board upon command, said apparatus including gripper means for gripping the leads of a component and pivoting about a pivot axis perpendicular to the longitudinal axis of the apparatus, drive means for actuating said pivotal gripper means, and a plunger for engaging the body of said component to drive the leads into said holes, the improvement comprising:

a guide tube vertically displaceable along and rotatable about said longitudinal axis and supporting said pivotal gripper means, said longitudial axis fixed vertically;

displacement means for vertical displacement of said guide tube along said longitudinal axis;

guide means for determining rotating or straight line movement of said guide tube along said longitudinal axis during vertical displacement of said guide tube;

first sensor means for sensing the vertical displacement of said guide tube; and

a guide jaw extending downwardly from a main body and flexible leaf jaws cooperating with said guide jaw to provide slots of a configuration suitable for receiving said leads in a flexible interference fit relation during said receiving and prior to said gripping such that shifting of said leads is avoided.

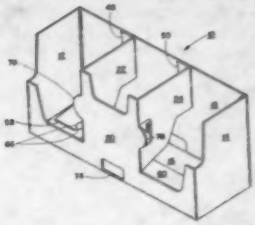
4,403,727

MULTI-COMPARTMENTED DISPLAY CARTON

Harold R. Grieve, and Thomas S. Andersen, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,179
Int. Cl.³ B65D 5/48
U.S. Cl. 229—27 **10 Claims**

1. A foldable multi-compartment display carton including front and back side walls; two opposite end walls; a bottom wall structure; and at least one partition extending in spaced parallel relationship to said end walls so as to form said compartments, each said partition comprising a flap cut out from portions of said front side wall and end walls to provide full height corners between the back side wall and end walls and between the front side wall and said flap, said flap being glued to said back side wall, and said front, back and end walls and partitions having at least a portion of their top edges extending



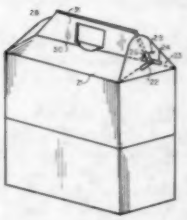
in a horizontal plane at the same maximum height extending above said bottom wall structure.

4,403,728

COLLAPSIBLE GABLE TOP CONTAINER

Irving M. Klotz, 2085 Islington Ave., Penthouse 9, Weston, Ontario, Canada M9P 3R1

Continuation of Ser. No. 157,390, Jun. 9, 1980, abandoned, which is a continuation-in-part of Ser. No. 153,911, May 28, 1980, abandoned. This application May 10, 1982, Ser. No. 377,539
Int. Cl.³ B65D 5/10, 5/46, 25/28
U.S. Cl. 229—39 R **24 Claims**



1. A container prepared from a single blank of paperboard and/or the like and having an integral handle and a reusable top closure locking means comprising:

a. opposed pairs of side walls;

b. opposed pairs of end walls foldably connected to said opposed pair of side wall to define a tube;

c. bottom closure panel means foldably connected to the lower ends of said side walls and end walls, to form a complete bottom closure;

d. a top closure flap foldably attached to the upper end of each of said side walls, to define a top closure for said container;

e. a handle element foldably attached to and integral with each of said top closure flaps;

f. locking tabs extending from two opposing ends of said handle elements;

g. locking flaps foldably connected to the upper ends of each of said end walls, each of said locking flaps having a locking slot positioned to receive a locking tab; and

h. said locking slots extending arcuately in at least one direction to permit said locking tabs to rotate in said locking slot and to permit said top closure flaps to rotate about there fold lines, about 90 degrees.

4,403,729

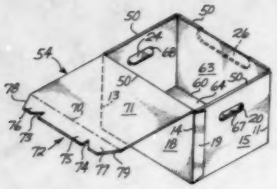
FILE FOLDER BOX

Richard Wytko, Olympia, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 284,426, Jul. 20, 1981, abandoned, and Ser. No. 358,981, Mar. 17, 1982, Pat. No. 4,373,660. This application Jul. 26, 1982, Ser. No. 402,019

Int. Cl.³ B65D 5/10, 5/22

U.S. Cl. 229—39 R **11 Claims**



1. A container blank comprising

first, second, third and fourth panels serially connected by score lines,

means for connecting said first and fourth panels in the completed container,

bottom closure panels extending from selected lower edges of said first, second, third and fourth panels,

two of said first, second, third and fourth panels having similar dimensions and being opposed side walls in the erect container,

the other two of said first, second, third and fourth panels having similar dimensions and being opposed front and back panels in the erect container,

a front reinforcing panel having the same height as said back panel and being hingedly attaced by a score line to the upper edge of said front panel,

an aperture through the outer face of said front panel,

a cover panel extending from the upper edge of the back panel and being hinged to said back panel along a score line,

a front closure flap hinged to the outer edge of said cover panel, said front closure flap having a closure tab having a length substantially equal to the length of said front panel aperture,

the distance between said front closure flap hinge and the inner edge of said closure tab being less than the distance between said front reinforcing panel hinge and the lower edge of said front aperture, and

the distance between said front closure flap hinge and the outer edge of said closure tab being greater than the distance between said front reinforcing panel hinge and the lower edge of said front aperture.

4,403,730

MAILBOX STAND

Bruce L. Batson, Stratton Lake Rd., Ashland City, Tenn. 37015

Filed Jun. 5, 1981, Ser. No. 270,889

Int. Cl.³ B65D 91/00

U.S. Cl. 232—39 **6 Claims**

1. A mailbox stand for supporting a standard rural delivery mailbox adjacent to a road, comprising:

a steel fence post for being secured in the ground adjacent the road and having a T-shaped cross section formed by a base member and a cross member attached at its midsection to one end of said base member;

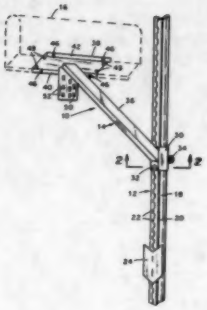
a plurality of studs disposed along the length of said fence post projecting from the outer surface of said cross member in a direction away from said base member;

a sleeve dimensioned for fitting over and sliding along the length of said fence post;

an indent in said sleeve for engaging and interacting with said studs on said fence post to fasten said sleeve to said fence post at a selected position;

a threaded aperture formed in said sleeve on the opposite side of said sleeve from said indent and being diposed in a laterally offset position on one side of said sleeve so that said aperture is spaced laterally with respect to said base member of said fence post; and

a set screw disposed in said threaded aperture and extending along and beside said base member to engage said cross



member, said set screw being operable when tightened to force said fence post to one side of the sleeve into a binding position and to urge said indent toward said fence post into a position above and engaging a selected one of said studs of said fence post;

a truss arm extending from said sleeve and having an outer end disposed in a position spaced apart from said fence post; and

means for mounting the mailbox on the outer end of said truss arm.

4,403,731

INTEGRATED HEAT PUMP AND HEAT STORAGE SYSTEM

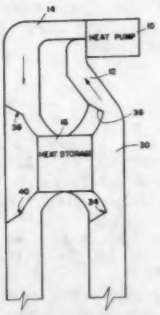
Ami Katz, Ramat Gan, Israel, assignor to Electra (Israel) Ltd., Tel Aviv, Israel

Filed Mar. 12, 1982, Ser. No. 357,648

Claims priority, application Israel, Mar. 13, 1981, 62344

Int. Cl.³ F24D 11/02

U.S. Cl. 237—2 B **3 Claims**



1. An integrated heat pump and heat storage system comprising:

a heat pump;

a first conduit for supplying return air from an enclosure to said heat pump;

a second conduit for supplying heated air from said heat pump to said enclosure;

heat storage means selectably communicating with said first and second conduits;

first damper means operative in a first orientation to permit return air from said enclosure to enter said first conduit and to prevent return air from passing through said heat storage means and operative in a second orientation to cause return air to pass through said heat storage means for being heated thereby before entering said first conduit; and

second damper means operative in a first orientation to cause heated air from said second conduit to pass through said heat storage means for giving up a portion of its heat for storage and operative in a second orientation to prevent heated air from said second conduit from passing through said heat storage means and to permit heated air from said second conduit to reach said enclosure.

4,403,732

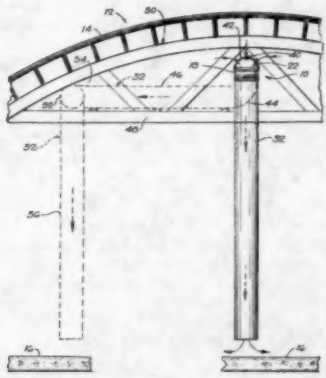
ENERGY SAVING HEAT RECYCLING SYSTEM

Theodore Primich, 4400 W. 9th Ave., Gary, Ind. 46406

Filed Aug. 18, 1980, Ser. No. 178,982

Int. Cl.³ F24D 5/00

U.S. Cl. 237—50 **9 Claims**



1. An energy saving heat recycling system for circulating hot air from the top portion of a building to the lower portion of the building near the floor level,

said system comprising a generally cylindrical supporting sleeve,

a fan assembly having an electric motor with a rotatable shaft and a fan blade mounted on the shaft, said fan assembly being on a bracket and the bracket being mounted on said sleeve, the fan blade being rotatably disposed within said sleeve,

said sleeve having an intake end into which air is to be drawn by said fan and a discharge end from which air is to be discharged by said fan,

said sleeve being capable of being mounted in the top portion of a building from which hot air is to be drawn by said fan into said intake end of said sleeve,

and a flexible tubular duct connected to said discharge end of said sleeve to convey the hot air to the lower portion of the building near the floor level so that the hot air is reused to heat the lower portion of the building,

said duct being in the form of a tube made of thin flexible material which is compactly foldable for storage and shipment and which makes it possible to bend and thread said duct around obstructions and through openings.

4,403,733

TRACK ASSEMBLY FOR TOY TRAINS

Erik Bach, and Jan Ryan, both of Billund, Denmark, assignors to Interlego A.G., Switzerland

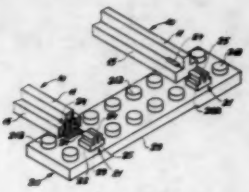
PCT No. PCT/DK80/00080, § 371 Date Jul. 22, 1981, § 102(e) Date Jul. 22, 1981, PCT Pub. No. WO81/01799, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 15, 1980, Ser. No. 285,098

Claims priority, application Denmark, Dec. 20, 1979, 5465/79

Int. Cl.³ E01B 23/00; A63H 33/00

U.S. Cl. 238—10 E **2 Claims**



1. A track assembly for toy trains comprising a plurality of rails and ties having coupling means for detachably mounting the ends of the rails on the ties, wherein the rails are elongated, substantially rod-shaped elements having an upper face and a bottom face, a longitudinally extending rail-forming rib integral with the upper face and a longitudinally extending cavity in the bottom face, and wherein the ties are rectangular plate elements having a bottom face and a top face provided with upwardly extending coupling studs, characterized by the combination of the following features:

(a) in the rails: an aperture (bottom aperture) in the bottom of the cavity adjacent either end of the rail extending toward the rib and another aperture extending transversely through the rib (rib aperture) at the interface of said upper face and rib and communicating with the bottom aperture,

(b) on the ties: at least one pair of upwardly extending spring clips spaced apart at a distance corresponding to the rail gauge of the track, each of said spring clips comprising a socket having a width substantially equal to the width of the cavity in the rails and a height corresponding to the depth of the cavity, and a pair of upwardly extending and resiliently deformable tongues spaced apart from each other a distance substantially equal to the width of the bottom aperture and a height substantially equal to the depth of the bottom aperture and adapted to be received in and fill the bottom aperture, said tongues terminating at their upper ends in outwardly extending projections which overlie said upper face whereby when the socket is pressed into the cavity said socket fills the cavity and said tongues fill said bottom aperture and said projections extend into said rib aperture and over said upper face for cooperating with said socket seating in said cavity for detachably interlocking the ties with the rails in a double locking action.

4,403,734

EXPANDING-SLEEVE RAIL FASTENING

John T. Gorman, Seven Hills, Australia, assignor to Lyncross Pty, Ltd., Kenmore, Australia

Filed Jan. 22, 1981, Ser. No. 227,521

Claims priority, application Australia, Feb. 7, 1980, PE2284

Int. Cl.³ E01B 9/10

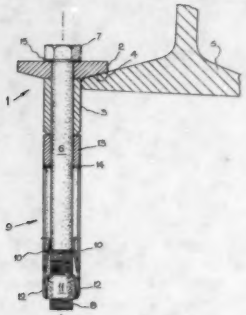
U.S. Cl. 238—372 **6 Claims**

1. An expanding-sleeve rail fastening, comprising:

a lug portion adapted to bear upon a rail foot;

a headed bolt having a threaded end and adapted to extend through an aperture in said lug portion and beyond into a bore provided in a permanent way sleeper via a sleeper plate spiked thereto;

a sleeve having radially-expandable, pronged portions surrounding said bolt and adapted to fit snugly into said bore;
a deformable collar interposed between said lug portion and said sleeve; and
a captive nut screwable onto the threaded end of said bolt, said nut being tapered towards its bolt-head end: the arrangement being such that, when said sleeve is inserted into said bore and said lug portion brought to bear on said



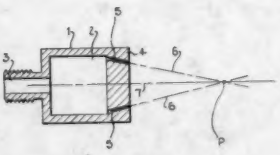
rail foot, said headed bolt is rotatable so as to cause said tapered nut to wedge in the lower end of said sleeve and, by continuing rotation of said bolt, to engage the radial inner surface of said pronged portions and to cause said pronged portions of the sleeve to be forced radially outwards; whereby said pronged portions are caused to grip the wall of said bore and whereby said lug portion is caused to firmly clamp said rail foot against said sleeper plate.

4,403,735

FLUID OPERATED NOZZLES FOR GENERATION OF VIBRATIONS IN LIQUIDS

Colin R. Weaver, Warwickshire, England, assignor to Rolls Royce Limited, London, England

Continuation of Ser. No. 940,283, Sep. 7, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,143
Claims priority, application United Kingdom, Sep. 15, 1977, 38503/77
Int. Cl.³ B01F *5/18, 11/02*
U.S. Cl. 239—1 **17 Claims**



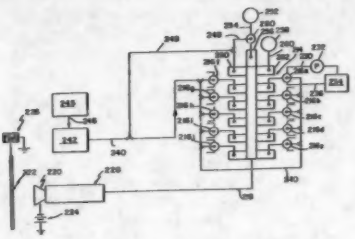
1. A method of creating ultrasonic vibrations in a liquid comprising:
producing a plurality of discrete flows in the liquid; and
directing the flows such that they converge to come near to each other and to pass but do not intersect, such that a convergent-divergent vortex is produced in the liquid sufficient to cause cavitation to occur within the vortex.

4,403,736

UNCONTAMINATED PURGE SOLVENT RECOVERY SYSTEM

James A. Scharfenberger, Indianapolis, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

Continuation of Ser. No. 326,151, Nov. 30, 1981, Pat. No. 4,350,720, which is a continuation-in-part of Ser. No. 228,166, Jan. 26, 1981, Pat. No. 4,311,724, and Ser. No. 275,872, Jun. 22, 1981, Pat. No. 4,348,425. This application Jun. 18, 1982, Ser. No. 389,695
Int. Cl.³ B05B *15/02, 7/16;* **F23D** *11/34, 13/28*
U.S. Cl. 239—112 **5 Claims**



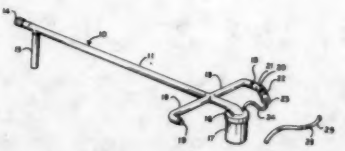
1. An apparatus for terminating the flow of a coating material in a coating material delivery system which delivers the coating material to a dispensing device from which the material is dispensed during a coating operation and from which flow of the material ceases at the end of the coating operation, the apparatus including means for terminating the flow of coating material to the dispensing device, means for initiating and terminating the flow of a fluid cleaning medium to the dispensing device, and means for establishing a partial vacuum on the remaining cleaning medium.

4,403,737

WATER-HOSE-POWERED GARDEN/AGRICULTURAL SPRAYERS AND SPECIAL NOZZLE

Homer H. Hancock, 4025 State St., Space 59, Santa Barbara, Calif. 93110

Filed Dec. 8, 1980, Ser. No. 214,480
Int. Cl.³ B05B *7/30*
U.S. Cl. 239—154 **1 Claim**



1. An agricultural spraying apparatus comprising:
coupling means for connecting the apparatus to a source of water;
a container for spray liquid concentrate;
a cap with means to receive said container;
a first nipple secured to said cap;
a hose coupled to said first nipple;
a nozzle means, said nozzle means including (a) a second nipple to which said hose is connected; (b) a screw-threaded end; (c) a diaphragm located downstream of said screw-threaded end and having a plurality of inclined passages for producing a swirling flow of water, (d) a transverse wall downstream of said diaphragm, said wall having a centrally located hole for the passage of said swirling flow of water, and (e) a shallow depression on a downstream end of said wall, said depression surrounding said hole, said nipple extending to said depression so as to

feed by gravity the concentrate from the container to said depression whereby as water flows through said hole in the form of a mist it picks up and carries the concentrate out of said nozzle means; a valve upstream of the nozzle means for controlling the flow of water to said nozzle means; support means for supporting said container and nozzle means that includes (a) said coupling means, (b) an elongate tubular conduit extending from said coupling means, (c) a short handle extending laterally away and in opposite directions from said elongated tubular conduit near the downstream end there-of and, (d) two short extensions extending laterally away and in opposite direction from said elongated tubular conduit near the downstream end there-of and, (e) each said short extension receiving a 45° elbow at its downstream end, each said 45° elbow having screwthreads which cooperate with the screwthreads of the nozzle means to secure same to the support means, the portion said elongated tubular conduit extending downstream of said short extension terminating in said cap, said elongated tubular conduit, said short extensions, and said 45° elbows being hollow so as to allow the flow of water from the coupling means to said nozzle means, and plug means for closing off the 45° elbow not having the nozzle means.

4,403,738

DEVICE FOR SPRAYING AQUEOUS MIXTURES

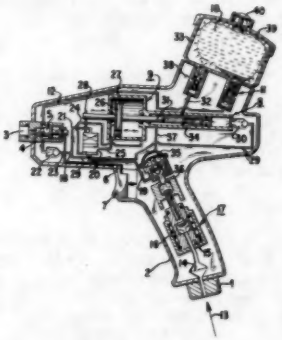
Hans Kern, Vachendorf, Fed. Rep. of Germany, assignor to Lang Apparatebau GmbH, Siegsdorf, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,296

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118207

Int. Cl.³ B05B 7/26

U.S. Cl. 239—313 **8 Claims**



1. In a spraying means having a connection to inflowing water under pressure, a nozzle spray head with mixing chamber and outlet valve that can be opened and closed by a trigger means, and a metering pump with pump drive for the quantity-proportional metering of a chemical from a chemical container into a stream of water in the mixing chamber,

the improvement which comprises

(a) a pressurized water feed, having a minimum pressure valve unit and leading to the mixing chamber of the nozzle spray head, which water feed is fed first to a water motor provided with a drive piston driven by the pressure of the inflowing water and then to a double-action metering pump having a metering piston coupled with said drive piston of the water motor, the cross-sectional area of the metering piston and the cross-sectional area of the drive piston being in a predetermined ratio;

(b) a flexible container for chemicals residing in a detachable rigid vessel connected to a metering outlet line of the metering pump, said flexible container being connected to the mixing chamber of the nozzle spray head by a container outlet valve and a container line, the chemicals being displaced from the flexible container by water metered through the metering outlet line into the vessel;

(c) a feedback line leading from the cylinder of the metering pump to a pressure water connection valve that is capable of closing in the event of overpressure in the metering pump to shut off inflowing pressurized water.

4,403,739

DEVICE FOR AERATING A JET OF WATER

Francesco Knapp, 17, via Ferrini, Pavia, Italy, and Alfons Knapp, Bleicherstrasse 3, Biberach an der Riss, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,588

Claims priority, application Italy, Jan. 15, 1981, 67035 A/1981

Int. Cl.³ E03C 1/084

U.S. Cl. 239—428.5 **7 Claims**

1. A device for aerating a jet of water, comprising a substantially cylindrical wall defining an inner mixing chamber and a bottom delivery orifice, air intake openings traversing said cylindrical wall, means for jet regularization arranged within said delivery orifice, and at the upper end of said cylindrical wall a pulverization device comprising a first element having at least one ring series of openings and a second element also having at least one ring series of openings, said second element being superimposed onto said first element with the openings of said second element in register with the openings of said first element only along short portions adjacent the edges of the openings, whereby the openings of said first and second element together form restricted passages for water, whose cross section is substantially lesser than the cross section of the openings themselves, said restricted passages being formed between the opposite edges of each opening of each element and the contiguous edges of two subsequent openings of the other element, whereby each pair of subsequent restricted passages generates two small water jets slanting the one towards the other.

4,403,740

FUEL INJECTION NOZZLE

Ewald Eblen, Stuttgart; Karl Hofmann, Neckarrems, and Odon Kopse, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 886,323, Mar. 13, 1978, Pat. No. 4,285,471. This application May 6, 1981, Ser. No. 261,062

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711393

The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.

Int. Cl.³ F02M 61/04

U.S. Cl. 239—533.4 **12 Claims**

1. A fuel injection nozzle for internal combustion engines comprising, in combination,

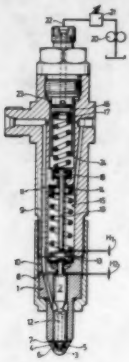
a nozzle body having a first set of fuel injection openings and fuel inlet means for applying pressurized fuel to said first set of injection openings,

a slidable valve needle in said nozzle body,

means for applying a closing force to said valve needle against which said valve needle opens for moving said valve needle into closing relationship with said first set of injection openings,

a control piston slidably disposed in said nozzle body for acting at one side on said valve needle,

a spring in said nozzle body for loading said control piston in a closing direction of said valve needle,



inlet means in said nozzle body for applying a pressurized control fluid from an associated source of fluid pressure to said control piston and

means for controlling said control fluid pressure independently of the pressure of said pressurized fuel supplied from said fuel inlet means to said first set of injection openings.

4,403,741

ELECTROMAGNETIC FUEL INJECTION VALVE

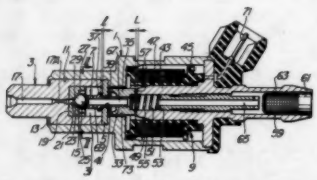
Hisanori Moriya; Masakichi Momono; Masahiro Souma, and Masami Nagano, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1981, Ser. No. 229,839

Claims priority, application Japan, Jan. 30, 1980, 55-10749

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—585 **6 Claims**



1. An electromagnetic fuel injection valve comprising:

a main body case of the cylindrical shape;

nozzle means located at one end of said main body case and including a fuel injection passage and a valve seat of a conical shape formed at an inner end of said fuel injection passage;

an electromagnet located at the other end of said main body case in alignment with said valve seat of conical shape, said electromagnet including a core and an electromagnetic coil located around said core;

movable valve means located midway between an inner end of said core and said valve seat of conical shape substantially in alignment with said valve seat and said core, said movable valve means including a plunger disposed adjacent said core and cooperating with the core to form a magnetic circuit, a ball adapted to be brought into and out of engagement with said valve seat of conical shape, and a rod having said plunger and said ball secured to opposite ends thereof;

spring means normally urging said movable valve means into engagement with said valve seat of concial shape by its biasing force;

first guide means for physically guiding the outer periphery of said ball; and

second guide means for physically guiding the outer periphery of said rod to enable said movable valve means to move axially thereof.

4,403,742

USE OF ROD MILL FOR INITIAL STAGE OF SOLDER GLASS GRINDING

Marinda L. Wu, Fremont, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1980, Ser. No. 206,333

Int. Cl.³ B02C *17/20, 19/12*

U.S. Cl. 241—29 **4 Claims**

1. The method of grinding an alkali metal borate glass which comprises:

a.

charging to a rod mill particles of said glass comprising from about 60 to about 97 mole percent of B_2O_3 and a total of from about 3 to about 30 mole percent of one or more alkali metal oxides,

said glass having a Vickers hardness number of from about 200 to about 700,

said rods and the mill lining having Vickers numbers higher than that of the glass and being composed of the same or different, non-brittle materials;

b. grinding said glass in said mill until the particles have a volume average diameter greater than 7, up to about 11 microns and a dispersity factor greater than 4, up to about 5; and

c. grinding the resultant powder with Alundum balls, while in contact with a C_{12}–C_{42} aliphatic amine and at a temperature which is greater than 50° C. but less than the softening point of said glass, until at least some of the powder particles have been reduced to fragments having effective diameters of less than one micron.

4,403,743

ARTICULATED KNIFE ROTOR ASSEMBLY IN A MACHINE FOR REDUCING MATERIALS

Joseph C. V. Ducasse, Martinez, Calif., assignor to Fabcon Incorporated, San Francisco, Calif.

Filed Jun. 3, 1981, Ser. No. 270,124

Int. Cl.³ B02C *13/26*

U.S. Cl. 241—194 **20 Claims**

1. An articulated knife rotor assembly for use in a machine for reducing materials, said assembly comprising:

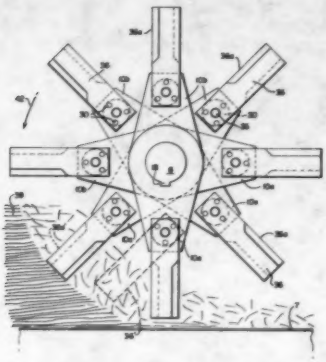
a shaft adapted to be rotated about the longitudinal axis thereof;

a plurality of blade holders arranged in axial alignment on said shaft, each said blade holder being fixed on said shaft and prevented from axial, radial and rotary movement with respect thereto, each said blade holder including end portions extending in opposite radial directions from said shaft, each said blade holder end portion having therethrough a journal opening having an axis extending parallel to said shaft axis;

a plurality of block members each including a cylindrical journal portion and at least one reduced diameter guide pin portion extending coaxially from a respective end of said journal portion, said journal portion of each said block member being positioned within and in journal contact with an inner surface of said journal opening of a respective said blade holder end portion, such each said

block member is relatively rotatable with respect to said blade holder about said axis of said journal opening;

each said guide pin portion having positioned thereon a respective knife blade; and



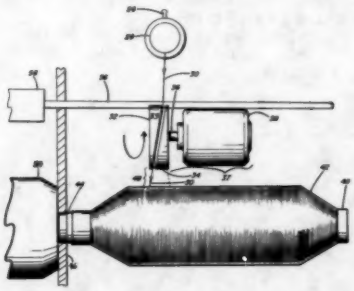
means for attaching each said knife blade to the respective said block member, such that said knife blade is rotatable with said block member about the respective said journal opening axis, but is prevented from rotation relative to said block member.

4,403,744

METHOD AND APPARATUS FOR CONTROLLING STRAND TENSION DURING WINDING

Walter J. Reese, North Huntington, Pa., and Jimmy D. Walker, Shelby, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 31, 1981, Ser. No. 297,603
Int. Cl.³ B65H *54/02*
U.S. Cl. 242—18 G **23 Claims**



1. A method of controlling strand tension during winding of filamentary material from a source, comprising:

a. contacting the filamentary material from the source with a rotating contacting means having an eccentric groove on the peripheral surface of said contacting means and having a drive means so that the filamentary material contacts the groove of the contacting means,

b. driving the rotating contacting means in a reverse direction to the direction of movement of the filamentary material to provide a draw to the filamentary material contacting the groove,

c. reciprocatingly traversing the filamentary material leaving the rotating contacting means,

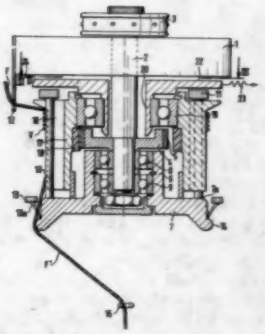
d. collecting the reciprocating filamentary material directly from the rotating contacting means onto a rotating collecting means having a drive means which pulls the filamentary material from the source into contact with the groove of the rotating conicting means so that the filamentary material is guided onto the rotating collecting means that is located at an effective distance from the grooved rotating contacting means to provide a nonparallel disposition of the filamentary material onto the rotating collecting means to produce a layered package of strand where every layer has the filamentary material in a nonparallel disposition.

4,403,745

THREAD STORING AND FEEDING DEVICE

Lars H. G. Tholander, Huskvarna, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Oct. 2, 1981, Ser. No. 307,987
Claims priority, application Sweden, Oct. 2, 1980, 8006886
Int. Cl.³ B65H *51/20*
U.S. Cl. 242—47.01 **19 Claims**



1. A thread storing and feeding device, particularly for textile machines with intermittent thread consumption, comprising:

a thread storage body mounted for rotation about a first axis and adapted to store thread windings therearound, said windings being wound tangentially onto said body and unwound therefrom in an axial direction;

said storage body having first and second drums, said first drum having circumferentially spaced slots formed therein and said second drum having bars which project into said slots for rotatably driving said first drum from said second drum, and said second drum being mounted with its longitudinal central axis disposed in inclined and eccentric relationship relative to said first axis;

mounting means supporting said second drum for movement relative to said first drum in response to the quantity of thread windings stored therearound; and

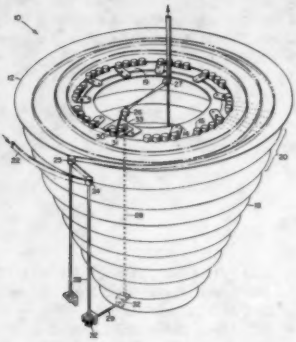
drive means for controlling the rotational speed of said body in response to the relative position between said drums to thereby control the thread windings around said body, said drive means including a rotatable drive shaft having a driving friction lining thereon, and a driven friction lining fixed to said second drum and engageable with said driving friction lining in response to relative movement between said drums to effect rotational driving of said body.

4,403,746

CONTINUOUS LOOP FILM PROJECTING APPARATUS

Roberto M. Garza, P.O. Box 7036, San Antonio, Tex. 78207

Filed Sep. 2, 1980, Ser. No. 183,437
Int. Cl.[3] G03B *21/00*; G11B *23/06*
U.S. Cl. 242—55.19 R 9 Claims



1. A continuous loop film projecting apparatus comprising:

a frame;

a revolving platter supported on said frame, said platter having a large outer diameter and a smaller inner diameter;

film friction reducing means cooperating with said platter, said means reducing friction between film received on said revolving platter and a receiving surface of said revolving platter, said film friction reducing means comprising:

a series of air outlets in said platter; said air outlets being holes arranged in a pattern of rows of closely spaced holes intermixed with rows of widely spaced slanted holes, a blower mounted on said frame; and

means to convey air from said blower to and through said air outlets in said platter;

seal means on said air conveying means, said seal means contacting the underside of said platter;

guide means mounted on said frame adjacent said platter inner and outer diameters, said guide means maintaining film received on said platter as said platter revolves in a configuration to subsequently be projected;

feeding means mounted on said frame adjacent said platter inner diameter, said feeding means receiving film from said platter and dispensing said film to a projector; and

means for driving said platter, said guide means and said feeding means.

4,403,747

CONTINUOUS LOOP FILM PROJECTING APPARATUS

Roberto M. Garza, P.O. Box 7036, San Antonio, Tex. 78207

Continuation-in-part of Ser. No. 183,437, Sep. 2, 1980. This application Feb. 12, 1981, Ser. No. 233,920
Int. Cl.[3] G03B *21/00*; G11B *23/06*
U.S. Cl. 242—55.19 R 11 Claims

1. A continuous loop film projecting apparatus comprising:

a frame;

a revolving platter supported on said frame, said platter having a large outer diameter and a smaller inner diameter;

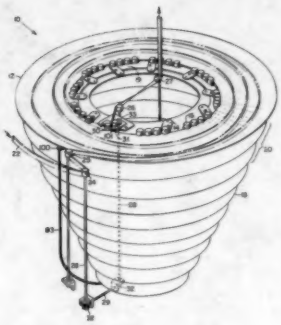
film friction reducing means cooperating with said platter, said means reducing friction between film received on said revolving platter and a receiving surface of said revolving platter, said film friction reducing means comprising:

a series of air outlets in said platter,

a blower mounted on said frame, and

means to convey air from said blower to and through outlets in said platter;

air injecting means mounted adjacent said platter inner and outer perimeters, said air injecting means comprising a first nozzle positioned adjacent said outer perimeter of said platter and a second nozzle positioned adjacent said inner perimeter of said platter, said first nozzle injecting air onto said film to provide a cushion between layers of



said film and said second nozzle injecting air between adjacent layers of film to separate said layers, said air injecting means allowing friction between layers of said film to be reduced;

feeding means mounted on said frame adjacent said platter inner diameter, said feeding means receiving film from said platter and dispensing said film to a projector; and

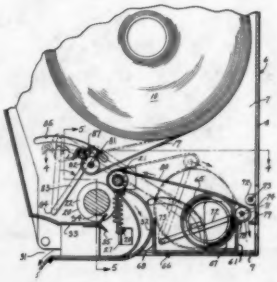
means for guiding said platter, said guide means and said feeding means.

4,403,748

DISPENSER FOR COILED MATERIAL HAVING IMPROVED TRANSFER MECHANISM

Robert W. Cornell, Milwaukee, Wis., assignor to Griffith-Hope Company, Milwaukee, Wis.

Filed Aug. 27, 1981, Ser. No. 296,816
Int. Cl.[3] B65H *19/00*
U.S. Cl. 242—55.53 15 Claims



1. A dispenser for coiled sheet material such as paper toweling, comprising a housing having a discharge opening, first support means disposed in the housing to support a first partially consumed roll of first sheet material, second support means disposed within the housing to support a second reserve roll of second sheet material, feed roll means disposed within the housing for feeding a sheet from either of said rolls through said discharge opening, and a transfer mechanism for transfer-

ring the feed from the partially consumed roll to the reserve roll, said transfer means comprising a transfer frame pivotally connected to the housing and including a first arm and a second arm, said arms disposed generally parallel to each other and disposed parallel to said feed roll means, said first sheet material extending rearwardly from said partially consumed roll beneath said first arm and then forwardly to said feed roll means, said second arm being spaced from said feed roll means when said first roll is in a partially consumed condition, sheet engaging means on said second arm for engaging the free end of said second sheet material, and biasing means for biasing the frame in a direction to urge said second arm towards said feed roll means, consumption of said partially consumed roll causing the first arm to move downwardly to thereby pivot the frame and move said second arm towards said feed roll means and deliver said second sheet material to said feed roll means to feed the second sheet material from the dispenser.

4,403,749

TAPE REEL

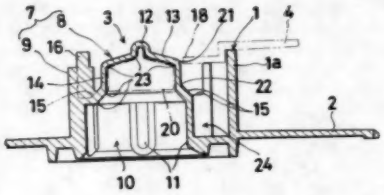
Akira Nakagawa, Tokyo, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Mar. 6, 1981, Ser. No. 241,240

Claims priority, application Japan, Mar. 7, 1980, 55-28807[U]; Mar. 7, 1980, 55-28808[U]

Int. Cl.³ B65H *75/18, 75/20*

U.S. Cl. 242—71.8 **26 Claims**



1. An improved tape reel comprising a hub for winding a tape on the periphery thereof, a pair of flanges attached one each to the opposite end surfaces of said hub, the first of the pair of flanges being molded integrally with said hub and the second flange being molded separately of the hub, said hub containing a socket opening into the free end of the hub and adapted to receive a reel rotating shaft in a recording/playback machine in the axial direction, the free end of said hub having a plurality of bosses raised from the free end surface, said second flange being provided with holes at the positions corresponding to those of said bosses, whereby the union of said hub and said second flange for the completion of the tape reel is accomplished by inserting the bosses on the hub into the corresponding holes in the second flange and crushing the protruding tips of the bosses against the second flange by means of ultrasonic vibrations, the improvement comprising:

providing the hub with means for virtually uniformly absorbing the impacts of said ultrasonic vibrations throughout the free axial end of said hub.

4,403,750

BAIL LATCHING AND RELEASING MECHANISM FOR SPINNING REEL

Yoshinori Morimoto, Fuchu, Japan, assignor to Ryobi, Ltd., Hiroshima, Japan

Continuation of Ser. No. 138,633, Apr. 8, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 373,186

Claims priority, application Japan, Apr. 9, 1979, 54-47153[U]; Apr. 9, 1979, 54-47164[U]

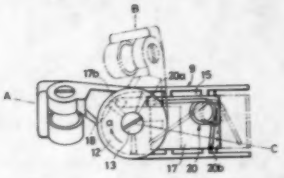
Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **9 Claims**

1. An outer spool type spinning reel of the type including a bail arm pivotably mounted at both ends to support housings positioned at diametrically opposite sides of a rotor for swinging movement of the bail arm thereacross between fishing line releasing and rewinding positions, and bail support members each coupled to said respective ends of said bail arm, said bail support members being rotatably secured to said respective support housings, the improvement comprising a bail arm latching and releasing mechanism assembled in either one of said support housings, said bail arm latching and releasing mechanism comprising:

(a) a kick lever secured in said one of said support housings, said kick lever being slidable along an axial direction of said rotor,

(b) a dead-point spring having one end connected to said kick lever and the other end connected to one of said bail support members disposed on said one of said support housings to selectively bias said bail arm toward its fishing line releasing and rewinding positions,



(c) a compression spring connected to said kick lever and extended along the axial direction of said rotor, said one of said bail support members having a bottom face provided with a boss to provide urging force to said kick lever and said other end of said dead-point spring and to receive urging force therefrom, and

(d) an operation cam secured to a stationary portion of a reel body, said operation cam being adapted to displace said kick lever when said bail arm is at the fishing line releasing position in order to rotate said one of said bail support members, to thus urge said bail arm from its fishing line releasing position to its rewinding position, said displacement of said kick lever also displacing said one end of said dead-point spring causing a dead-point line of said dead-point spring to also be displaced.

4,403,751

DEVICE FOR LOCKING WEBBING FOR THE SEAT BELT OF AN AUTOMOTIVE VEHICLE

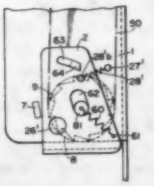
Shuichi Asano, Kawasaki, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1981, Ser. No. 290,085

Claims priority, application Japan, Aug. 7, 1980, 55-108512

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **3 Claims**



1. In a device for locking the webbing for a seat belt of an automotive vehicle, said device including a reel adapted to have the webbing of the seat belt wound therearound and biased in a direction to wind the webbing therearound, a rotatable drum spaced from said reel and adapted to have the web-

bing wound at least partially therearound, a drum base supporting said drum and adapted to pivot about an axis eccentric from the axis of rotation of said drum, a base supporting said reel and said drum base, a fixed plate provided on said base with a sufficient distance with respect to said drum to permit the webbing to pass therethrough, means for sensing an emergency condition of the vehicle, means responsive to said sensing means for preventing rotation of said reel and said drum when an emergency condition of the vehicle is sensed by said sensing means, said drum base being adapted to pivot about its eccentric axis to press said drum into contact with said fixed plate and hold the webbing tightly therebetween when the rotation of said reel and said drum is prevented to thereby impede the the webbing from being drawn from said reel by the tightening thereof therearound, the improvement residing in that said means for preventing rotation of said drum is fixed to said drum base, and said drum is mounted for movement relative to said drum base.

4,403,752

AUTOMATIC ROLL-UP DEVICE FOR SAFETY BELTS

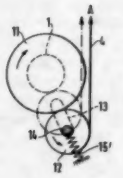
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk G.m.b.H., Alfdorf, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,518

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033745

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **4 Claims**



1. Automatic roll-up device for a safety belt having a winding shaft connected to a roll-up spring and to an automatic locking device for locking the winding shaft carrying a belt web winding roll which will vary in diameter, the roll-up device also having a braking roller located downsteam of the winding shaft in direction of pull of the belt web, the braking roller being in the form of a movable clamping member partly looped around by the belt web and actuatable for clamping the belt web after locking of the winding shaft by the automatic locking device, said braking roller lying at the periphery of the web roll and displaceable in direction of the winding shaft to follow the changing diameter of the web roll, the belt web extending from the belt web winding roll to said braking roller and partly looped around said braking roller in a direction opposite to the direction the web is wound on the winding roll, pressing means for urging said braking roller against the belt-web winding roll at all varying diameters of the belt-web winding roll during normal operation without clamping the belt web and, during abnormal operation when an elevated pulling force is applied to the belt web, the braking roller being pressed by the elevated pulling force against the belt web winding roll for clamping and locking the belt web winding roll.

4,403,753

COIL SPOOL FOR AN ELECTROMAGNETIC DEVICE

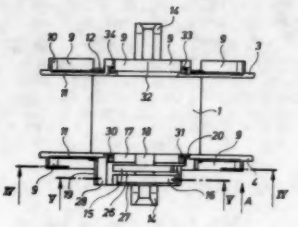
Christoph Gibas, Neunkirchener Weg 5, 5908 Neunkirchen, and Michael Müller, Zum Turm 1, 6683 Spiesen/Elversberg, both of Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,563

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1980, 3026760

Int. Cl.³ B65H *75/28;* **H01F** *15/10*

U.S. Cl. 242—125.2 **6 Claims**



1. A coil spool for an electromagnetic device, comprising

a central cylindrical portion for receiving a wire coil thereon;

first and second end flanges extending radially from and axially spaced along said central cylindrical portion;

first and second outwardly opening pockets for receiving connections between wire coil ends and external conductors, said pockets being axially aligned relative to said central cylindrical portion and formed on said first end flange, and including

a first notch extending on said first end flange at an acute angle with a radius and at one side of said pockets through which a wire from one wire coil end can pass to said first pocket,

wall means adjacent said first notch defining a slot for receiving said wire, and

a second notch extending through said first end flange at the other side of said pockets through which a wire from the other wire coil end can pass to said second pocket,

whereby said wires can be led into said pockets within the flange circumference.

4,403,754

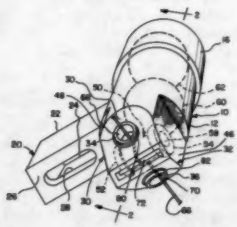
YARN TENSION WITH HORIZONTAL ROLLER

Edward J. McBride, Jr., P.O. Box 311, Moorestown, N.J. 08052

Filed Sep. 22, 1980, Ser. No. 189,606

Int. Cl.³ B65H *59/24*

U.S. Cl. 242—151 **27 Claims**



1. A roller type yarn tension device comprising a hollow body defining a generally vertical interior channel, the body

being downwardly formed to provide a pair of diametrically opposed, angularly oriented, converging, bottom walls,

each bottom wall being provided with a grommet receiving opening; a grommet loosely retained in at least one said bottom wall opening, the grommet having a body defining an interior channel therethrough, the channel defining a yarn path through the tension device,

the grommet being adapted to have limited movement within its respective opening, the grommet comprising means to retain the grommet within its associated opening; and

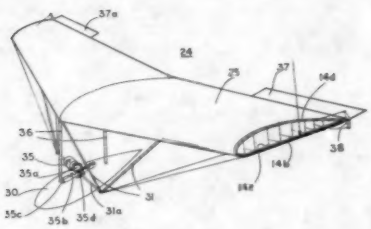
a roller horizontally oriented within the interior body channel and positioned to roll over and seat upon a portion of the grommet to tension a yarn as it travels through the said yarn path.

4,403,755

METHOD AND APPARATUS FOR USE IN HARNESSING SOLAR ENERGY TO PROVIDE INITIAL ACCELERATION AND PROPULSION OF DEVICES

Gunter E. Gutsche, 5175 Rue Forget, Box 666, St. Louis de Terrebonne, Quebec, Canada J0N 1N0

Filed Feb. 14, 1980, Ser. No. 121,493
Int. Cl.³ F03G *7/02;* B64B *1/24*
U.S. Cl. 244—53 R **22 Claims**



1. A method of providing acceleration and propulsion of a vehicle in an environment having at least some fluid, said vehicle having at least one member, at least a lower surface portion of which is treated for absorbing solar radiation for heating fluid adjacent the exterior of said member for use in propelling said vehicle through said environment, in the improvement comprising the steps of:

(a) exposing said treated portion to solar radiation and intentionally heating fluid adjacent the exterior of said member thereby increasing the pressure and volume of said external fluid; and

(b) exciting and thereby accelerating said heated fluid away from said lower surface portion in a manner to provide thrust and lift to said vehicle and accordingly providing propulsion of the vehicle, the acceleration of said fluid including allowing said heated and accordingly buoyant fluid to rise and accelerate against said member while deflecting said rising fluid in a direction so as to enhance said propulsion including the step of purposely allowing a flow of further external fluid to be heated.

4,403,756

BIFURCATED FEEL SIMULATOR FOR AIRCRAFT

J. Burton Berlin, Mercer Island, and Erwin V. Schweizer, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

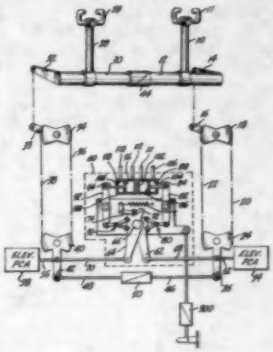
Filed Dec. 22, 1980, Ser. No. 218,469
Int. Cl.³ B64C *13/46*
U.S. Cl. 244—223 **3 Claims**

1. In a dual path flight control system having separate control paths linking the control surfaces of an aircraft to each of a pilot control stick and a copilot control stick, the improvement comprising a single feel unit coupled to both paths of said control system, said feel unit including:

a first lever constructed and arranged for pivotal movement about a first axis said first lever being coupled to and driven by said pilot control stick;

a second lever constructed and arranged for pivotal movement about said axis, said second lever coupled to and driven by said copilot control stick;

a feel load-generating means for producing a feel force representative of the aerodynamic forces acting on the aircraft control surfaces; and,



linkage means associated with said first and second levers and said feel load-generating means for coupling said first and second levers to said feel load-generating means such that said feel force opposes motion of said levers and such that said feel load-generating means is operable in the event of a jam in one path of said dual path system which jam renders inoperative a portion of the control surfaces of the aircraft to provide feel force to the other path of the dual path system that is representative of the aerodynamic forces acting on the remaining operative portion of the control surfaces.

4,403,757

MODULATING FLUID SHEAR COUPLING

Michael Shepherd, Carmel, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,734
Int. Cl.³ F16D *33/12, 35/00, 43/25*
U.S. Cl. 192—58 B **21 Claims**

1. A modulating fluid shear coupling apparatus which comprises:

a driving member including a disc-shaped portion having a first side including a shear surface;

a driven member defining a working chamber within which said driving member is received, said driven member including a shear surface configured and positioned complementary with the shear surface of said driving member and driving therewith a fluid shear chamber cooperable with a shear fluid received therein for transmitting torque between said driving member and said driven member;

mount means for mounting said driven member to said driving member and rotatable about a common axis;

a shear fluid reservoir;

input flow means for providing flow of shear fluid from said reservoir to a first location of the working chamber on the first side of said driving member and radially-inward of the shear surface of said driving member;

first output flow means for providing flow of shear fluid from a second location of the working chamber on the first side of said driven member to said reservoir, the second location being radially-outward of the shear surface of said driving member, said first output flow means being capable of returning to said reservoir substantially all shear fluid moved to the first location of the working chamber by said input flow means;

first output control means for selectively opening and closing said first output flow means;

second output flow means for providing flow of shear fluid from a third location of the working chamber on the first side of said driving member to said reservoir, the third location being radially intermediate the shear surface of said driving member, said second output flow means being capable, when said first output control means closes said first output flow means, of returning to said reservoir substantially all shear fluid moved to the first location of the working chamber by said input flow means; and

second output control means for selectively opening and closing said second output flow means;

said apparatus having a first coupling condition in which said first output control means opens said first output flow means to substantially fill the working chamber with shear fluid radially-inward to the second location and consequently to cause fluid shear coupling between said driving and driven members, said apparatus having a second coupling condition in which said first output control means closes said first output flow means to substantially fill the working chamber with shear fluid radially-inward to the third location and consequently to cause fluid shear coupling between said driving and driven members greater than in the first coupling condition, and said apparatus having a third coupling condition in which said first and second output control means close said first and second output flow means, respectively, to substantially fill the working chamber with shear fluid radially-inward of the third location and consequently to cause fluid shear coupling between said driving and driven members greater than in the second coupling condition.

4,403,758

WASTE PIPE SUPPORT APPARATUS

Howard N. M. Burt, P.O. Box 478, Osoyoos, B.C., Canada

Filed Sep. 30, 1981, Ser. No. 307,113

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—49 **19 Claims**

1. Apparatus for supporting a waste pipe normally interconnecting a vehicle waste drain pipe with a permanent camp site sewage head, comprising:

a first support member for supporting a first portion of said waste pipe;

a second support member for supporting a second portion of said waste pipe, said second member being slideably disposed within said first support member;

leg means pivotably mounted, within a longitudinally extending plane, relative to said first support member so as to be disposed either in an operative or storage position and for supporting said first support member in an elevated position relative to the local terrain upon which said apparatus is to be disposed when said leg means is disposed in said operative position;

bracket means fixedly secured to said first support member;

said leg means being pivotably mounted within said bracket means;

first means defined within said bracket means for selectively mounting said leg means within any one of a multiplicity

of positions within said bracket means so as to selectively permit elevational adjustment of said leg means relative to said apparatus; and

second means fixedly secured within said bracket means and projecting laterally outwardly therefrom so as to intercept said pivotable leg means within said longitudinally extending plane and thereby block the pivotable movement of said leg means within said longitudinal plane beyond which point said leg means cannot be moved, said point defining said operative position for said leg means.

4,403,759

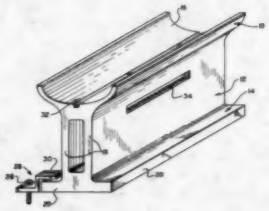
CATHODIC CORROSION RESISTANT PIPE SADDLE WITH LOW FRICTION INSERT

Chester F. Hicks, 203 N. Main, Walbridge, Ohio 43465

Filed Oct. 21, 1980, Ser. No. 199,242

Int. Cl.³ F16L *3/16*

U.S. Cl. 248—55 **4 Claims**



1. A pipe saddle for supporting a pipe above a supporting surface comprising:

a cradle in the form of a segment of a right-circular cylinder;

a pedestal for said saddle having an inverted T-shaped cross-section, said pedestal including a base portion and a web portion connecting said base portion and said cradle, said base portion having longitudinal flanges extending on either side of said web portion and said web portion having two parallel, transversely spaced apart longitudinal walls;

a cavity formed in the bottom surface of said base adapted to removably retain a bearing element;

a bearing element removably inserted in said cavity and protruding beyond the bottom surface of said base, said bearing element having a relatively low coefficient of friction with respect to the supporting surface on which it is adapted to be mounted;

a plurality of brackets adapted to be secured to the supporting surface on which said bearing element is to be mounted, said brackets including portions adapted to

overlie said flanges on said base such that vertical and lateral movement of said pipe saddle is restricted and sliding movement of said base between the supporting surface and said brackets in the direction of the longitudinal axis of said cradle is permitted;

and

a drain channel formed in an upper surface of said cradle for receiving condensation which forms on the pipe supported in said cradle, said drain channel extending parallel to the longitudinal axis of said cradle and having a bottom wall formed higher at the center of the cradle than at the ends.

4,403,760

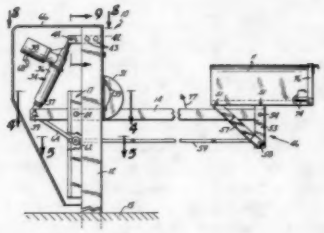
APPARATUS FOR RAISING AND LOWERING AN OBJECT

Palmer C. Alvermann, Rte. 1, Box 138, Clear Lake, Wis. 54005

Filed Jun. 11, 1981, Ser. No. 272,657

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—284 **31 Claims**



1. An apparatus for selectively moving an object between first and second positions and holding the object in a desired position comprising: a support, an arm, means pivotally connecting the arm to the support allowing the arm to move relative to the support, an expandable and contractible means connected to the support and arm operable to pivot the arm between first and second positions, means adapted to be connected to an object, means connecting the arm to the means adapted to be connected to an object, control means located adjacent to said arm, means connecting the control means to the means adapted to be connected to an object, track means secured to the support, means connected to the control means cooperating with the track means to guide the control means along the track means, link means connecting the arm and control means whereby on operation of the expandable and contractible means the arm pivots and control means move along the track means and the means adapted to be connected to an object move between first and second positions.

4,403,761

APPARATUS FOR WALL MOUNTED PRESENTATION BOARDS

Walker Jamar, 365 S. First Ave., East, Duluth, Minn. 55802

Filed Jan. 6, 1981, Ser. No. 222,383

Int. Cl.³ E04G *5/06*

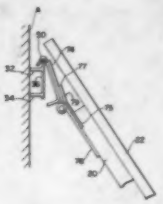
U.S. Cl. 248—441 B **9 Claims**

1. Apparatus for wall mounting of a presentation board comprising:

a wall mounted support bracket;

mounting means for detachably engaging said support bracket; and

support means connecting said mounting means to the presentation board such that the board is supportable in an inclined position with respect to the mounting wall when said mounting means is operatively engaged with said support bracket in a board supporting position, said support means including an angled member having first and second legs pivotally connected together and also respectively connected to said mounting means and to the board such that the angle between said mounting means and the board is variable and a spring means for biasing said first leg with respect to said second leg such that when the board is removed from said support bracket said first leg is held away from said second leg and in a position to permit the mounting means to be readily re-attached to said support bracket.



4,403,762

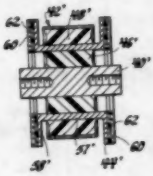
LOW FORCE TRANSMISSIBILITY MOUNT

James A. Cogswell, II, Clarkston, and Donald E. Malen, Lathrup Village, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 20, 1981, Ser. No. 236,335

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—559 **3 Claims**

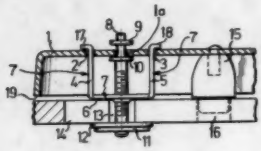


1. In a mounting arrangement for mounting a vibratory body on a supporting structure wherein the acceptable transmission of vibratory forces from the vibratory body to the supporting structure imposes a low level limit of transmissibility in a low frequency range, a high level limit of transmissibility in an intermediate frequency range, and a lowest level limit of transmissibility in a high frequency range: an improved mount comprising an intermediate mass independent of the supporting structure and vibratory body and adapted to be frequency tuned, first elastomeric coupling means for coupling said intermediate mass and the supporting structure, second elastomeric coupling means for coupling said intermediate mass and the vibratory body, an absorber mass independent of the supporting structure and vibratory body and intermediate mass and adapted to be frequency tuned, third elastomeric coupling means for coupling said absorber mass and intermediate mass, and said intermediate mass and absorber mass predetermined in combination with the elastomeric characteristics of all said coupling means so that said intermediate mass has upper and lower resonances of predetermined substantially different force transmissibility amplitude situated within the intermediate frequency range such that the force transmissibility of said mount is attenuated to below the lowest level throughout the high frequency range while also remaining below the other transmissibility level limits throughout their respective frequency range.

4,403,763
TRANSPORT SECURING DEVICE FOR RECORD PLAYERS

Helmut Dold, Untertalstr. 23, 7743 Furtwangen 6, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,584
Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120425
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—561 **5 Claims**



1. A transportation securing device for a turntable, the base plate of which when in operating condition rests, with the interposition of elastic support elements, on a mounting plate, comprising

a spacer member arranged substantially below the base plate of the turntable, said spacer member has a lower part and a top part, said lower part is formed with a female thread and has a bottom side projecting downwardly past a lower edge of said base plate, said spacer member including on said top part thereof upper projections which extend non-rotatably through said base plate of the turntable and rest loosely thereon,

said base plate is formed with a bore,

a screw seated in said female thread of the spacer member and extending upwardly through said bore formed in the base plate,

a lower collar on said screw being larger in diameter than said bore in the base plate of the turntable and lies therebelow, and upon screwing up said screw said lower collar clamps the base plate between said lower collar and said upper projections of said spacer member,

a foot part fastened on a lower end of said screw,

said mounting plate is formed with a laterally open recess, said recess is smaller in diameter than that of said foot part,

said screw is tiltably mounted on the base plate of the turntable, being swingable into and out of said laterally open recess in the mounting plate, said foot part being disposed below the mounting plate,

said mounting plate is clampable between said bottom side of said spacer member and said foot part of said screw by said screwing up of said screw,

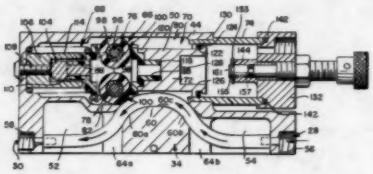
said foot part of said screw is arranged at such a distance from said lower collar of said screw that upon said screwing up of said screw, said base plate of the turntable and the mounting plate are simultaneously clamped fast.

4,403,764
METHOD AND APPARATUS FOR CONTROLLING FLOW OF WORK MATERIALS

Thomas J. Repplinger, Cary, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Oct. 8, 1981, Ser. No. 309,711
Int. Cl.³ F16L *55/14*
U.S. Cl. 251—5 **5 Claims**

1. A compact unitary actuator and pinch valve assembly for positive suck back of work material on shutoff comprising body means having straight travel surface, resilient conduit means mounted on said body means and having an inlet, outlet, intermediate portion, and a normal configuration permitting full flow of work material from said inlet therethrough to said outlet, linearally movable actuator means within said body means movable in a plane parallel with said straight travel surface, linearally movable conduit engaging means operatively associated with said actuator means for movement between first, second and third positions, linearally alligned positions, the direction of movement from said first to second to third positions being substantially counter direction to the flow of work material in said intermediate portion of said resilient conduit means, and parallel with said straight travel surface, said linearally movable conduit engaging means having roller means with first and second roller means portions, said first roller means portion being in rolling engagement with said straight travel surface, said second roller means portion being engageable with said intermediate portion of said resilient conduit means, said conduit engaging means in said first position being operatively arranged to have said second roller

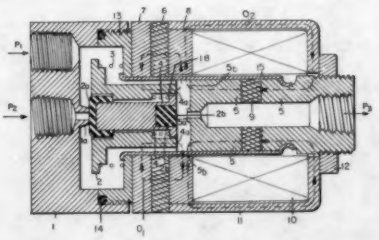


means portion spaced to operatively permit said resilient conduit means to maintain its normal configuration and full flow of material therethrough, said conduit engaging means while in and while moving between its second and third positions being operatively arranged to have said second roller means portion engage and compress said intermediate portion of said resilient conduit means to maintain stoppage of flow of work material therethrough, said conduit engaging means second roller means portion being further operable when moving from said second to third positions to permit a portion of the area previously compressed when said conduit engaging means was in its second position to move under inherent resiliency toward normal configuration and thereby cause a partial internal vacuum in said resilient conduit means to in turn cause suck back of material downstream thereof at said outlet.

4,403,765
MAGNETIC FLUX-SHIFTING FLUID VALVE

Richard T. Fisher, Pembroke, Mass., assignor to John F. Taplin, Newton, Mass.

Continuation of Ser. No. 97,079, Nov. 23, 1979, abandoned. This application May 18, 1981, Ser. No. 264,365
Int. Cl.³ F16K *31/08*; H01F *3/12*
U.S. Cl. 251—65 **17 Claims**



1. A magnetic flux-shifting valve having two different positions to control the paths of the flow of a fluid, said valve comprising

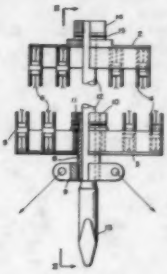
(a) a pair of relatively movable fluid-flow control parts including a valve element and a valve seat cooperating with said valve element;

(b) means for biasing said valve element away from said valve seat;
(c) a first fixed permanent magnet having a relatively large coercive force;
(d) a first soft iron member in physical engagement with one pole surface of said first magnet;
(e) a second soft iron member in physical engagement with the other pole surface of said first magnet;
(f) a pair of cooperating pole pieces of soft iron capable of forming a working gap therebetween, said pair of pole pieces including a movable pole piece and a fixed pole piece, said valve element being integral with said movable pole piece and said valve seat being integral with said fixed pole piece;
(g) said first magnet establishing a first closed flux path in the first position of said flux-shifting valve including one pole surface of said first magnet, said first soft iron member, said movable pole piece, said second soft iron member, and back to the other pole surface of said first magnet;
(h) a tubular soft iron member defining a fluid passageway jointly with said valve seat;
(i) a casing of soft iron forming a cavity for housing a flux-shifting electromagnet, said casing extending from the end of said tubular member opposite said fixed pole piece to said first magnet;
(j) a second fixed permanent magnet having a relatively small coercive force in comparison to said first magnet, said second magnet being supported by said tubular member which forms said fixed pole piece on one end of said second magnet, said second magnet establishing in said first position of said flux-shifting valve a second closed flux path separate from said first flux path except for the portion of said second flux path in said second soft iron member, said second flux path including one pole surface of said second magnet, a portion of said tubular member, said fixed pole piece, said second soft iron member, said casing, another portion of said tubular member, and back to the other pole surface of said second magnet;
(k) an electromagnet in said casing for reversing the polarity of said second magnet to establish said second fluid control position of said flux-shifting valve wherein the fluxes of said first magnet and said second magnet are in series and the single closed flux path of said first magnet and said second magnet include a pole surface of said second magnet, a portion of said tubular member, said casing, said first magnet substantially excluding said second soft iron member, said first soft iron member, said movable and said fixed pole piece, another portion of said tubular member, and back to the other pole surface of said second magnet; and
(l) fluid passage means defined by the space between said first magnet and said movable pole piece for admitting fluid to said valve seat when said valve element is separated from said valve seat.

4,403,766
BLOCK AND PULLEY ARRANGEMENT
Adolf Schmeider, Versbach, Fed. Rep. of Germany, assignor to Gg. Noell GmbH, Wurzburg, Fed. Rep. of Germany
Filed Feb. 21, 1980, Ser. No. 123,420
Int. Cl.³ B66D *3/08*
U.S. Cl. 254—399 **1 Claim**

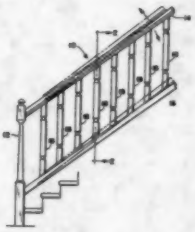
1. In a hoist for a load-lifting applicance including a housing for the pulleys, a shaft for supporting the load hook and projecting through said housing and being affixed to said housing, said pulleys being arranged inside said housing in coaxial relation to opposite sides of said shaft, and said hoist further including an additional load bearing member besides said load hook, the combination of

(a) a pulley-housing (1) including an upper pulley-housing part (2) and a lower pulley-housing part (3);
(b) a plurality of pairs of shaft-support plates (4) affixed to said upper pulley-housing part (2) and a plurality of pairs of shaft-support plates (4) affixed to said lower pulley-housing part (3), said pairs of shaft support plates in said upper and said lower pulley-housing parts (2,3) interleaving when said upper pulley-housing part (2) and said lower pulley-housing part (3) are in engagement;
(c) a plurality of pulleys (6) and a plurality of pulley-supporting shafts (5), each of said plurality of pulleys (6) being supported by a separate shaft of said plurality of pulley-supporting shafts (5);



(d) some of said plurality of pulley-supporting shafts (5) being supported by pairs of said shaft-supporting plates (4) affixed to said upper pulley-housing part (2), and others of said plurality of pulley-supporting shafts (5) being supported by pairs of said shaft-supporting plates (4) affixed to said lower pulley-housing part (3);
(e) a shaft (12) for supporting said load hook (13) rotatably supported by said upper housing part (2); and
(f) an additional load supporting member (9) rotatably supported by said lower housing part (3).

4,403,767
VARIABLE RACK STAIR RAIL ASSEMBLY
Gene Basey, 18447 Santar, Rowland Heights, Calif. 91748
Filed Dec. 29, 1980, Ser. No. 220,453
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—66 **11 Claims**



1. A variable rack stair rail assembly which comprises:
a hand rail,
a shoe rail,
a plurality of elongated balusters extending intermediate the shoe rail and the hand rail,
means for joining each of said balusters to said hand rail and said shoe rail, said means for joining comprising an elongated plug member and a socket member having an opening thereon, said plug and socket members having respective first axial extremities dimensioned and configured for mutual engagement, one of said members being disposed in cooperating relationship with one of said rails and the other of said members being disposed in cooperating relationship with one axial extremity of the balusters, and said socket member having one axial extremity to which said

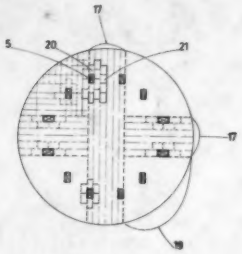
opening extends, said first axial extremity including an outwardly extending flange.

4,403,768

BOTTOM OF METALLURGICAL CONTAINER AND PROCESS OF FORMING THE SAME

Jean-Claude Grosjean, Semecourt, and Jean-Marie Landry, Maizieres-les-Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-en-Laye, France

Filed Nov. 30, 1981, Ser. No. 325,844
Claims priority, application France, Dec. 2, 1980, 80 25615
Int. Cl.³ C21C *5/44*
U.S. Cl. 266—44 **8 Claims**



1. A process of forming the bottom of a metallurgical container of the type which comprises a metallic base, at least a layer of refractory material superimposed on the metallic base, a first layer of refractory bricks superimposed on said layer of refractory material and a second layer of refractory bricks superimposed on said first layer, the steps of placing spaced from each other on said first layer of refractory bricks a plurality of refractory elements permeable to gas and each enclosed in a metallic casing having a bottom and a circumferential wall and being open at the top; surrounding the circumferential wall of the metallic casing of each of said elements with bricks of a material which expand during rise of the temperature so as to press during operation of the metallurgical container the peripheral wall of each metallic casing tightly against the respective gas permeable refractory element; and thereafter finishing the construction of said second layer by filling the remainder of the second layer with refractory bricks.

4,403,769

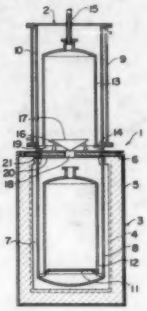
VACUUM SEPARATOR

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,417
Claims priority, application Japan, May 12, 1981, 56-71118
Int. Cl.³ F27B *5/04*
U.S. Cl. 266—149 **9 Claims**

1. In a vacuum separator for separating refractory metal from contaminants of magnesium metal and magnesium chloride mixed therewith, said vacuum seprator comprising a vertically elongated substantially cylindrical retort defining a closed space thereinside, a chamber capable of accomodating such mixture as loaded in a container, heating means for effecting evaporation of a substantial portion of said contaminants from such mixture, said chamber and heating means being provided in a lower section of the retort, a cylindrical surface, provided by an inside surface of another container for depositing thereon the contaminants which ascend in said retort as vapor, cooling means for effecting condensation of such contaminants on said surface, said surface and cooling means being provided in an upper section of said retort, and means for degassing the retort to an elevated degree of vacuum; the improvement wherein:

said retort further comprises a heat shield unit at an intermediate level between said upper and lower sections of the retort, said heat shield unit comprising a circular plate with a central bore and a flat solid disc larger than the bore, said disc being attached to but spaced from said circular plate, each of said circular plate and disc consisting of steel and being arranged at such a distance from one another, in relation to the bore, that the heat shield unit as



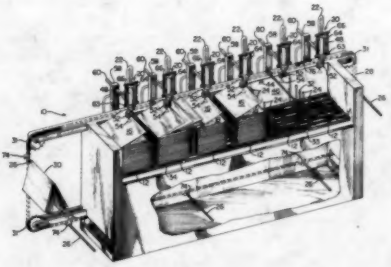
a whole blocks any direct sight of the surface of the lower section of the retort, when holding the container loaded with a mixture to be treated, from a substantial part of the condensation surface in the upper section, thus intercepting a substantial part of primary heat radiation from the retort lower section, while allowing passage of ascending vapor of contaminants.

4,403,770

APPARATUS FOR COLLATING SIGNATURES

Leonard Ferguson, 7206 W. Walden Pl., Littleton, Colo. 80123, and Jack W. Mefford, 395 Iris St., Broomfield, Colo. 80020

Filed Mar. 22, 1982, Ser. No. 360,190
Int. Cl.³ B65H *5/30*
U.S. Cl. 270—55 **12 Claims**



1. In a collating apparatus for sequentially engaging a plurality of individual folded signatures and gathering said signatures sequentially within each next signature in succession along the respective fold lines of said signatures for subsequent binding, the improvement comprising:

a plurality of juxtaposed signature stations for supporting said signatures;

vacuum producing means;

a suction delivery assembly including a suction port housing situated above each said signature station, each housing having a pivotal suction port in communication with said vacuum producing means, each said suction port engageable with the top leaf of a top signature disposed within its signature station, said suction delivery assembly including means urging each said suction port housing downwardly

into engagement with said signatures at each signature station, said assembly having actuator means to overcome the downward urging of said means and to cause upward movement of each said housing only upon application of a vacuum through each said suction port when said suction port is in engagement with a signature; and

at least one collector rod means movable between the leaves of the successive signatures as said signatures are engaged and lifted by the application of vacuum through respective said suction ports, said rod means as it collects each signature thereon operative to cause pivotal movement of said suction port to a position interrupting the application of vacuum through said suction port whereby to release said signature from said suction port as the vacuum is interrupted thereto.

9. In a collating apparatus capable of engaging for subsequent collection a plurality of individual singularly folded signatures arranged in supply stations for housing signatures, the improvement comprising:

vacuum applying means; and

a suction delivery assembly having a suction port housing, a portion of which is arcuately pivotal, and having protruding from said pivotal portion a suction port, said suction port housing having extending therethrough a vacuum delivery channel in communication with said vacuum applying means and extending first through a stationary portion of said housing and through said arcuately pivotal portion thereof, said suction port housing being in the form of a generally rectangular block provided with a vertically directed opening therein, said pivotal portion being pivotally mounted within said opening for downward projection of said suction port from said block, said channel extending through a portion of said block and said pivotal portion, means for yieldably urging said pivotal portion to a position forming a continuous channel through said block and pivotal portion of said suction port and said suction port including a lower extremity having a suction cup of rubber or rubber-like material thereon, the application of vacuum through said channel being interrupted when said pivotal portion of said housing is arcuately pivoted.

4,403,771

COPYING APPARATUS WITH SLIDABLY ATTACHED SORTER BIN

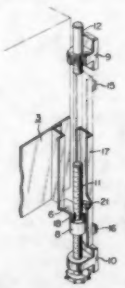
Junkichi Kasahara; Mitsuyoshi Nagashita, and Hiroyuki Honda, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1981, Ser. No. 258,798

Claims priority, application Japan, Apr. 30, 1980, 55-58205

Int. Cl.³ B65H *39/11*

U.S. Cl. 271—294 **3 Claims**



1. In a copying apparatus equipped with a sorter consisting of a bin supported for sliding up and down movement relative to a main frame, a feeding screw vertically supported on the main frame, a nut on said feeding screw, a first coupling extension attached at one end to said bin and at its other end slidably mounted on said feeding screw, a second coupling extension attached at one end to said bin and it its other end to said nut, and means for rotating said feeding screw to cause movement of said nut and up and down movement of said bin attached thereto, the improvement comprising a U-shaped guide rail vertically mounted on said main frame parallel to said feeding screw with the arms of said U extending toward said feeding screw and said second coupling extension, guide means intermediate said second coupling extension and said guide rail, said guide means having two faces projecting toward said U-shaped guide rail with one face slidably contacting the main inner vertical face of said U-shaped guide rail and the other face slidably contacting the inner face of one of the arms of said U-shaped guide rail, and an elastic shock-absorbing means intermediate said nut and said second coupling extension, whereby imbalance of the bin caused by the weight of stacked copies and vibrations caused by movement of said feeding screw are avoided by the cushioning effect of said shock-absorbing means and the regulated contact between said second coupling extension and said U-shaped guide rail through said guide means.

4,403,772

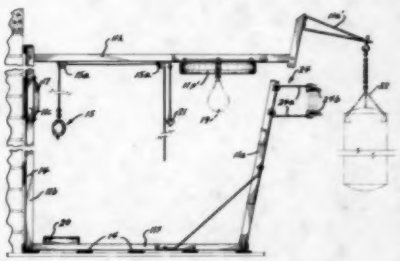
UNITARY SELF-CONTAINED PHYSICAL CONDITIONING STRUCTURE

Lynn B. Stangle, Box 25, St. Francisville, Ill. 62460

Continuation of Ser. No. 96,051, Nov. 20, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 302,316

Int. Cl.³ A63B *69/00*

U.S. Cl. 272—78 **1 Claim**

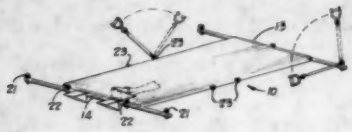


1. An athletic conditioning apparatus for the martial arts comprising a framework independently movable from one location to another on a floor surface, said framework defined as a unitary assembly represented by interconnecting rear members in a quadrangular relationship abutting an impact receiving upstanding wall, interconnecting upper members formed in a converging configuration in plan view having an apex area remote from said rear members supporting a subframework receiving a rebound ring and speed bag, an interconnecting base member mounting an upwardly angling member connecting to said apex area and supporting an outwardly extending portion for a conditioning unit, and other conditioning units selectively locatable on said upwardly angling member, said upper members, said rear members and said base member, where another base member and a rear member support flooring, and where resilient cushioning members isolate said rear members of said framework from said upstanding wall and said base members of said framework from said floor surface.

4,403,773
EXERCISING APPARATUS

David T. Swann, 18924 Lomond Blvd., Shaker Heights, Ohio 44122

Filed Mar. 10, 1980, Ser. No. 128,654
Int. Cl.³ A63B 23/04, 23/02
U.S. Cl. 272—134 2 Claims

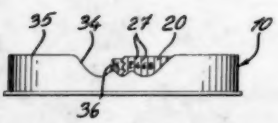


1. An exercise apparatus comprising an elongated rectangular flat and immovable support during use of said apparatus, anchoring means secured to said support at backend thereof and at intermediate portions lengthwise thereof, a plurality of detachable exercise means having connecting means adapted to be selectively secured to an arm and/or leg, tension means having fastening means at each end thereof adapted to be secured to said detachable exercise means and to selected said anchoring means said support being provided at each end with laterally outwardly extended arms having additional anchoring means at the ends thereof for arm and/or leg firming exercises when said spring tension arm and/or leg exercise means are secured to said additional anchoring means to selectively afford flexion, adduction and extension exercises of the selected terminal or torso portions of the unrestrained body of an exerciser.

4,403,774
DEVICE FOR OBTAINING READINGS OF STATISTICAL VARIABLES

Roger Turcotte, 4094 Harvard, Montreal, Quebec, Canada H4A 2W7, and Vincent Papillon, 5236 Durocher, Outremont, Quebec, Canada H2V 3Y1

Filed Jun. 26, 1981, Ser. No. 277,861
Int. Cl.³ A63F 5/04
U.S. Cl. 273—143 R 8 Claims

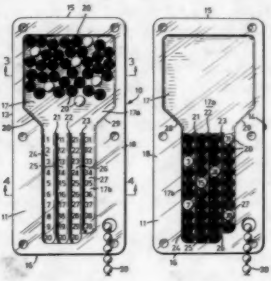


1. A device for obtaining readings of statistical variables in a random manner, said device comprising a base member having a bottom wall, a cylindrical side wall extending vertically above said bottom wall, a vertical centering post projecting from said bottom wall centrally of said cylindrical side wall, a data carrying circular spool having a circular bottom wall centrally supported for rotation on said post, said cylindrical side wall having reference means for obtaining a reading of information from said spool, a central hub extends above a top face of said spool bottom wall to constitute a finger grasping post to impart rotation to said spool, and a post receiving cavity extending into said hub from a bottom face of said spool to receive said centering post therein, said centering post being shorter than the depth of said cavity whereby said spool will rest on an elevated concentric portion of a top surface of said bottom wall, passage means in said cylindrical side wall for the admission of air in the area bounded by said cylindrical side wall to create an air cushion under said bottom wall of said spool when rotated on said support post to liberate said spool from frictional engagement with said elevated concentric portion, said concentric portion constituting a braking surface to frictionally arrest said spun spool when lowered thereon by gravity as it decreases its rotational speed.

4,403,775
RANDOM INDICIA SELECTOR

Joseph R. Chaput, 9 Deer Park Cres., Apt. 1501, Toronto, Ontario, Canada M4V 2C4

Filed Jun. 14, 1982, Ser. No. 388,092
Int. Cl.³ A63F 7/04
U.S. Cl. 273—144 B 13 Claims



1. Apparatus for randomly selecting at least one indicia comprising a container having an enclosed compartment having at least first and second sections communicating with each other; a plurality of balls located in said compartment and moveable between said two sections thereof, some of said balls being of a first colour and at least one of said balls being of a second colour; a window in said container through which said balls in said second section can be viewed; a plurality of indicia also viewable when viewing said second section through said window, said indicia being of a colour that does not contrast with said first colour but does contrast with said second colour, said second section, balls, window and indicia being so constructed and arranged that when said balls are in said second section they are located behind said indicia relative to a person looking into said second section through said window and said indicia that are adjacent said balls of said first colour are masked by said colour of said balls of said first colour and thereby rendered substantially invisible, while said at least one ball of said second colour forms a colour contrasting background for the one of said indicia adjacent thereto and highlighting the latter indicia as the one to be selected.

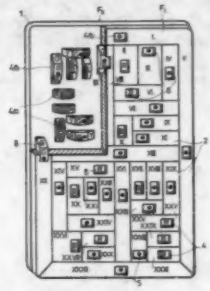
4,403,776
LOGIC TOY

Gyula Subotics; Gyulane Subotics, both of 52, Feribegyi u., Budapest 1173, and Lajos Nagy, 11, Jos u., Budapest 1036, all of Hungary, assignors to Gyula Subotics; Gyulane Subotics and Lajos Nagy, all of Budapest, Hungary

Filed Apr. 27, 1981, Ser. No. 257,920
Claims priority, application Hungary, Apr. 25, 1980, 1022
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 R 5 Claims

1. A logic toy for independently and distinctly signalling bordering zones designated on two oppositely lying logic game

surfaces of a body (1) of said toy, each said surface (F_I, F_{II}) of said body (1) being divided into a plurality of separated zones (2), wherein said body (1) comprises a plurality of signalling means, predetermined ones (4/a) of said signalling means each serving an individual one of said zones only on one of said surfaces, predetermined ones of said signalling means each serving an individual one of said zones only on the oppositely



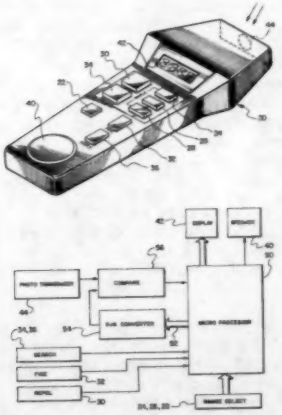
lying surfaces, and predetermined other (4/b) of said signalling means serving more than one of said zones simultaneously, each one of said zones being served simultaneously lying on one of said opposite surfaces, said signalling means comprising switchable disks (4) provided with signals thereon, whereby displaying a different signal for adjacent zones lying on the same surface can be accomplished.

4,403,777

ELECTRONIC GAME USING PHOTOTRANSDUCER

Robert M. Del Principe, Hawthorne; David A. Hostetler, Torrance, and John Ling, Hacienda Heights, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 8, 1981, Ser. No. 223,537
Int. Cl.³ A63F 9/00
U.S. Cl. 273—313 **16 Claims**



1. In a handheld electronic game for simulating search for an invisible being, the combination comprising:

means for providing at least one of a visible and audible stimuli;

phototransducer means for sensing incident and ambient light in the direction in which said game is pointed;

means responsive to an output from said phototransducer means for varying said at least one of said visible and audible stimuli for providing clues as to the whereabouts of the being;

means for establishing a reference light level, said means including means for randomly selecting at least one reference light level from said phototransducer means;

manually operable switch means; and

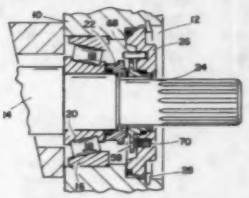
means for comparing the reference light level to the light impinging on said phototransducer means and correlating actuation of said switch means with said means for providing at least one of a visible and audible stimuli for further affecting said means for varying the stimulus so provided whereby to indicate to the operator the success or failure of locating the being.

4,403,778

FACE SEAL ASSEMBLY AND METHOD OF USE

Edward J. Shevokas, and William S. Bathgate, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 27, 1982, Ser. No. 382,492
Int. Cl.³ B23P 19/02
U.S. Cl. 277—1 **20 Claims**



1. A face seal assembly for transporting face seal elements while maintaining said face seal elements in a mutually abutting relationship, said face seal elements including a first element having a first sealing face and a second seal element having a second sealing face adapted to abut said first element sealing face to form a rotating seal interface, said face seal assembly characterized by:

a sleeve having said first and second elements axially positioned thereon with said sealing faces in abutting contact and with each of said elements frictionally engaging the outer surface of said sleeve in a manner which prevents relative axial movement of said elements and whereby said face seal assembly is adapted to be positioned within a housing in a final assembly position concentric with respect to a shaft with said first and second element sealing faces in an axially abutting relationship on said sleeve.

4,403,779

SEALS FOR LIQUID-TIGHT CLOSURE BETWEEN ROTARY COMPONENT AND PARTITION

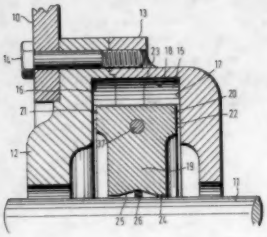
Samual C. W. Wilkinson, Chichester, England, assignor to Crane Packing Limited, Slough, England

Filed Nov. 19, 1982, Ser. No. 443,149
Claims priority, application United Kingdom, Nov. 21, 1981, 8135135
Int. Cl.³ F16J 15/18, 15/44, 15/46
U.S. Cl. 277—27 **7 Claims**

1. A seal for producing a liquid-tight closure between a rotary component and a partition separating two chambers, where the rotary component penetrates the partition, said seal comprising; a retaining means adapted to be mounted on the partition, so that it surrounds the rotary component as it passes through the partition, said retaining means defining an annular formation;

said annular formation overlapping radially, a corresponding formation on the outer portion of an annular floating

member, to locate said annular floating member axially while permitting a degree of radial movement, the inner surface of the floating member being dimensioned to give a small clearance about the rotary component; and sealing means associated with either the internal surface of the floating member or the opposed surface of the rotary



component; said sealing means being arranged to seal the gap between the floating member and the rotary component and opposed surfaces of the formations defined by the retaining means and the floating member being arranged to make sealing engagement, upon exposure to liquid, following flooding of one of the chambers separated by the partition.

4,403,780

ANNULAR FLUID SEALS

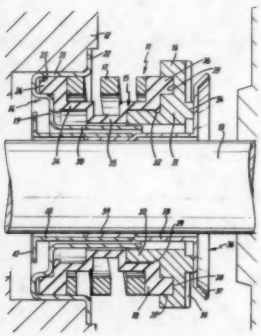
Charles W. Potter, Manchester, England, assignor to J. H. Fenner & Co. Ltd., Yorkshire, England

Filed Jul. 15, 1981, Ser. No. 283,626

Claims priority, application United Kingdom, Jul. 17, 1980, 8023469

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—88 **11 Claims**



1. A face seal arrangement for effecting a fluid seal between a housing and a shaft rotatable therein, comprising an annular shell, a diaphragm seated in said shell and having an end remote from the shell, a compression spring applying a loading to said diaphragm, a sealing member adjacent said end of the diaphragm and moveable in the axial direction of the seal under the effect of the spring-loaded diaphragm, the said sealing member having an annular sealing surface at an outer face thereof, and a sealing ring arranged in opposed disposition relative to the sealing member for cooperation with the annular sealing surface to effect a fluid seal therebetween, one of the annular shell and sealing ring being respectively mountable in the housing and the other of the annular shell and sealing ring being mounted on the shaft, the diaphragm including a body and spaced radial flanges, and said compression spring comprising material of rectangular transverse cross-section interposed between said flanges, each flange having an axially outer face and including a respective axially extending rim thereat, the shell and sealing member having respective seatings within which said rims are retainably engaged and are deformed to provide sealing contact therebetween.

4,403,781

SEALING ASSEMBLY FOR UNIVERSAL JOINT

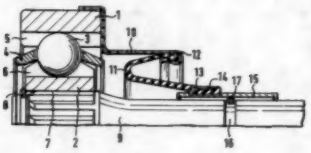
Helmut Riemscheid, Lohmar, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Sep. 22, 1981, Ser. No. 304,622

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035884

Int. Cl.³ F16D *3/84*; B61F *15/22*

U.S. Cl. 277—212 FB **3 Claims**



1. A sealing assembly for a universal joint including an inner joint member, an outer joint member, torque transmission means interposed between said inner and outer joint members, said torque transmission means including rolling members received in grooves of said inner and outer joint members, and a drive shaft connected in driving engagement with one of said inner and outer joint members, said sealing assembly comprising: a sleeve having a first end with a larger diameter and a second end with a smaller diameter, said first end of said sleeve being connected to the other of said inner and outer members; an annular groove formed in said drive shaft; a bush arranged to concentrically surround said drive shaft with a uniform radial distance therebetween; a sealing ring arranged within said annular groove between said bush and said drive shaft, said annular groove with said sealing ring arranged therein being located within an operating range of said bush thereby mounting said bush to be axially movable relative to said drive shaft within said operating range, said sealing ring operating as a contact seal relative to the inner diameter of said bush; and attachment means affixing said second smaller diameter end of said sleeve to the outer circumference of said bush.

4,403,782

PUSH-TYPE JAW CHUCK

James R. Buck, Hickory Corners, Mich., assignor to Buck Tool Company, Cape Coral, Fla.

Filed Jan. 30, 1981, Ser. No. 229,694

Int. Cl.³ B23B *31/16*

U.S. Cl. 279—121 **5 Claims**

1. A rotatable jaw chuck arrangement, comprising:

sleevelike body means rotatable about its longitudinally extending axis, said body means defining thereon a front face adjacent one axial end thereof, and a plurality of guide slots projecting radially of said body means;

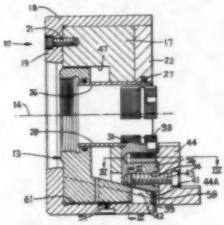
said body means including an inner sleevelike housing having said slots formed therein, said slots opening axially outwardly through said front face, said body means also including an outer sleevelike housing which is fixed to and snugly surrounds the inner housing so that said outer housing overlaps and closes off the radially outer ends of said slots;

a plurality of jaw carriers radially slidably supported within said slots directly adjacent said front face, said jaw carri-

ers having means associated therewith for gripping engagement with the outer periphery of a workpiece;

an actuator axially slidably supported on said body means adjacent the rearward end thereof, said actuator including a plurality of wedges projecting axially forwardly therefrom and being axially slidably engaged with said jaw carriers for effecting radial displacement thereof, the actuator and the wedges fixedly associated therewith being axially movable between a released position and a workpiece position, said actuator being moved axially forwardly when being displaced from said released position toward said workpiece-gripping position;

said wedges being sloped radially outwardly as they project axially toward said front face and being slidably engaged with similar sloped surfaces on the jaw carriers so that the jaw carriers are radially displaced inwardly for gripping engagement with a workpiece in response to a forwardly-directed pushing force imposed on the actuator;



said jaw carriers having sloped grooves extending axially therethrough for slidably receiving therein the respective wedge, said sloped grooves extending axially forwardly substantially to said front face, said sloped grooves also opening radially outwardly through the radially outer periphery of said jaw carriers, each said wedge when in said released position being disposed with the front free end portion thereof projecting only slightly into the groove of its respective jaw carrier, and each said wedge when the actuator is in said workpiece-gripping position being disposed so that its front free end portion projects into the groove of the respective jaw carrier through an axial distance which substantially exceeds a majority of the axial extent thereof; and

said wedges having an outer peripheral surface which is axially slidably supported directly on said outer housing on the portion thereof which is radially aligned with and closes off the radially outer ends of said slots.

4,403,783

LIQUID AND GRANULAR HAULING TRAILER

Frank E. Henderson, Plant City, Fla., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Jul. 22, 1981, Ser. No. 286,040
Int. Cl.³ B60P *3/24*
U.S. Cl. 280—5 G **15 Claims**

11. A vehicle with a tank having a body which extends along an axis, the body having a first end and a second end comprising:

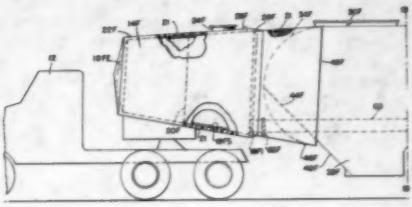
a first end chamber at said first end of said body and defined by a side wall portion, an exterior end wall portion, and an interior end wall portion;

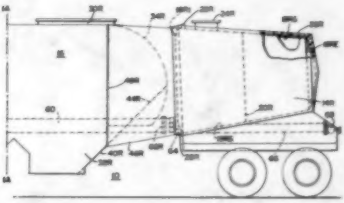
a second end chamber at said second end of said body and defined by a side wall portion, an exterior end wall portion, and an interior end wall portion;

a center chamber disposed in between said interior end wall portion of said first end chamber and said interior end wall portion of said second end chamber, said center chamber defined by center chamber walls and closed off from both said first end chamber and said second end chamber;

a first port for removing substances from said first end chamber; and,

an insulated pipe mounted to said body and connecting said first end chamber to said second end chamber, and wherein said first end chamber is inside of a first jacket





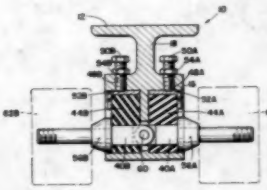
piece with insulation in between said first end chamber and said first jacket piece, and said second end chamber is inside of a second jacket piece with insulation in between said second end chamber and said second jacket piece and said insulated pipe extends from the bottom of said second end chamber to the bottom of said first end chamber.

4,403,784

ROLLER SKATE AXLE SUSPENSION

Robert C. Gray, P.O. Box 15262, Tulsa, Okla. 74112

Filed Jan. 22, 1981, Ser. No. 227,418
Int. Cl.³ A63C *17/02*
U.S. Cl. 280—11.28 **13 Claims**



1. In a roller skate comprising:

a skate body with an upper surface adaptable to receive a shoe thereon, and having forward and rearward downwardly extending suspension housings, at least one housing having an opening therethrough the axis of the opening being transverse the vertical plane of the skate body longitudinal axis;

an axle extending through each said suspension housing opening having an intermediate point and means at each end thereof to receive a skate wheel;

a first and second elastomeric member received in said suspension housing opening in spaced apart relationship, each elastomeric member engaging said axle in an area between the axle intermediate point and the portion receiving a skate wheel; and

means of separately adjustably varying the compressive force applied by each said elastomeric member against deflection of said axle in the direction towards said skate body.

4,403,785

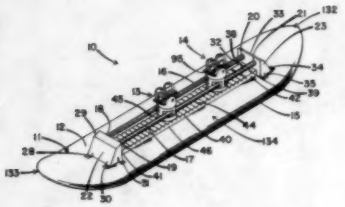
MONOSKI AND RELEASABLE BINDINGS FOR STREET SHOES MOUNTABLE FORE AND AFT OF THE SKI

John M. Hottel, 11 Broad Cove Rd., P.O. Box 35, Hingham, Mass. 02043

Continuation of Ser. No. 3,171, Jan. 15, 1979, abandoned. This application Jun. 4, 1981, Ser. No. 270,387

Int. Cl.³ B62B *13/06*; A63C *5/04*

U.S. Cl. 280—12 H **14 Claims**



9. Bindings for use on skis for releasably binding a person's foot to the ski surface and being capable of binding a person's ordinary street shoes or boots thereby permitting freedom of ankle movement comprising a first foot plate for supporting said person's shoes or boots, fastener means on said foot plate for securing the person's shoe or boot to the said first footplate, a second boot plate capable of pivotal movement in vertical direction for releasably and pivotally supporting the first said foot plate, means capable of rotation in a horizontal direction supporting said pivotal foot plates, spring means connecting said foot plate and said means capable of rotation whereby the pivotal movement of said first and second foot plates are controlled, and means supporting said rotatable means for mounting on a ski.

4,403,786

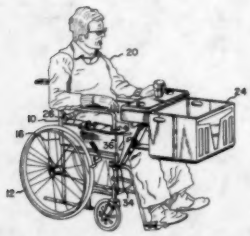
WHEELCHAIR SHOPPING BASKET

George Ulics, 1300 Venice, Dearborn, Mich. 48124

Filed Jan. 28, 1981, Ser. No. 229,186

Int. Cl.³ A61G *5/02*

U.S. Cl. 280—289 WC **5 Claims**



1. A Combination comprising,

a wheelchair having a frame;

wheel means supporting the frame;

seating structure mounted on the frame;

the frame having an opening for receiving an occupant to a seated position on the seating structure;

a basket having opening means and a vertical wall having a pair of spaced slots;

support means comprising,

a pair of horizontal support arms each connected to the wheelchair frame in a horizontal position;

a pair of inclined arms each having a lower end mounted on the wheelchair frame and an upper arm connected to one of said horizontal arms;

a clip mounted on each of the inclined arms;

a vertically disposed finger carried on each of said clips, said fingers being removably received in the pair of spaced slots in the vertical wall of the basket on opposite sides of the frame opening so as to be disposed to receive the opening means in the basket to support it in a position adjacent the frame opening in front of an occupant seated therein.

4,403,787

COVERING APPARATUS FOR A HANDLE BAR OF A BICYCLE

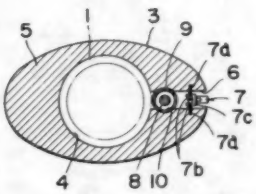
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 22, 1981, Ser. No. 275,665

Claims priority, application Japan, Jun. 27, 1980, 55-91243[U]

Int. Cl.³ B62K *21/26*

U.S. Cl. 280—289 H **5 Claims**



1. A covering apparatus for a handle bar of a bicycle, comprising:

a longitudinally extending body having a hollow into which said handle bar is insertable, said body being formed of a resilient material and having at one side thereof an open groove through which said hollow is open to the body exterior, said body having an insertion bore formed therealong on an interior surface thereof for retaining a control cable; and

a slide fastener arranged within and extending longitudinally along said groove for opening and closing the same, said slide fastener comprising a pair of engaging members extending longitudinally along said groove and a slider means having a control portion for engaging and disengaging said engaging members.

4,403,788

SKI BRAKE

Jean Bernard; Jean Beyl, both of Nevers; Christian Campillo, Garchizy; Rene Guerreau, Montmarault; Daniel Le Faou, Varennes Vauzelles, and Henri Peyre, Nevers, all of France, assignors to STE Look, Nivers, France

Filed Jul. 23, 1981, Ser. No. 286,195

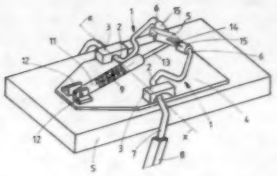
Claims priority, application France, Aug. 4, 1980, 80 17167

Int. Cl.³ A63C *7/10*

U.S. Cl. 280—605 **5 Claims**

1. A ski brake comprising a pair of arms each having a control end and a braking end, means pivotally mounting said arms about a horizontal axis transverse to the ski, said pivotally mounting means surrounding a portion of each arm with sufficient play to permit angular displacement of said arms in the plane of the ski, a flexible resilient strip disposed transversely of the ski and interconnecting the control ends of said braking arms, an elastic restoring member connected at one end to said

ski and at its other end to the control ends of said braking arms through said flexible strip, whereby said restoring member continually urges said arms to the active braking position in which the braking ends project beneath the plane of the ski, and a control pedal fixedly attached to said flexible strip for pivotal movement about a horizontal axis transversely of said ski and concurrent rotational movement of said resilient strip, whereby in the braking position of said arms the line of action of said restoring member is inclined with respect to the face of the resilient strip at such an angle that said restoring member



causes flexural deformation of said strip thereby having the effect of inclining the control ends of said braking arms toward one another and therefore outwardly displacing the braking ends of said arms with respect to one another, and in the raised position of said arms and the depressed pivotal position of said pedal the line of action of the restoring member is approximately parallel to the face of said resilient strip which therefore assumes a flat configuration, thus having the effect of restoring the control ends of said braking arms to their position of relative outward displacement, and therefore inwardly displacing the braking ends of said arms with respect to one another.

4,403,789

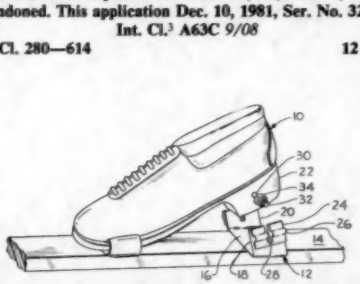
SKI TO BOOT ATTACHMENT MECHANISM

Robert J. Hickey, 2575 Blakely Rd., South Wales, N.Y. 14139

Continuation-in-part of Ser. No. 161,851, Jun. 23, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,320

Int. Cl.³ A63C *9/08*

U.S. Cl. 280—614 **12 Claims**



1. A system for releasably securing a heeled ski boot to a ski, comprising: a pair of upstanding legs on the ski and adapted to laterally confine opposite sides of a boot heel, a transverse pin affixed to said boot, vertical slot means in said upstanding legs and extending downwardly from the top edge of said upstanding legs to receive respective ends of said transverse pin, said slot means being arranged to permit vertical separation of said boot heel from said ski and having sides which abut said transverse pin to prevent relative longitudinal movement between said ski boot and ski when said transverse pin is in said vertical slot means, the opposite end portions of said transverse pin being threaded and having threaded nuts thereon which tighten against said upstanding legs.

4,403,790

CONNECTING MEMBER IN PARTICULAR FOR A SAFETY SKI BINDING WHICH IS EQUIPPED WITH A SKI BRAKE

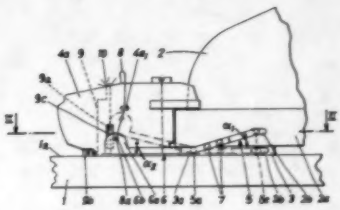
Helmut Bauer, and Tibor Szasz, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Feb. 2, 1981, Ser. No. 230,232

Claims priority, application Austria, Jan. 31, 1980, 493/80

Int. Cl.³ A63C *9/18*

U.S. Cl. 280—637 **11 Claims**



1. In an apparatus adapted to interconnect a ski boot and ski, including binding means adapted to be mounted on said ski and engageable with said ski boot for releasably securing said ski boot on the upper side of said ski, said binding means automatically releasing said ski boot in response to a force in excess of a predetermined value which urges relative movement of said ski boot and ski, and further means for interconnecting said ski boot and ski, said further means being adapted for manual engagement and release, the improvement comprising wherein said binding means includes a plate which is disposed between said ski boot and ski and has a first opening in each laterally facing side thereof, where in said further means includes said ski boot having a second opening in each side of the sole thereof, said second openings being disposed approximately above said first openings when said ski boot is releasably secured in said binding means, wherein said further means includes a generally U-shaped, resiliently flexible connecting member having a bight and two legs, said legs each having an inward projection thereon at the end thereof remote from said bight, said bight extending generally transversely of said ski and said connecting member being pivotally supported for movement about a transverse horizontal axis between first and second positions, said projections on said legs each being engageable with a respective said first opening when said connecting member is in said first position and a respective said second opening when said connecting member is in said second position, and wherein said further means includes manually actuable operating means cooperable with said connecting member for flexing said legs resiliently outwardly and facilitating pivotal movement of said connecting member between said first and second positions.

4,403,791

CARBONLESS DUPLICATING AND MARKING SYSTEMS

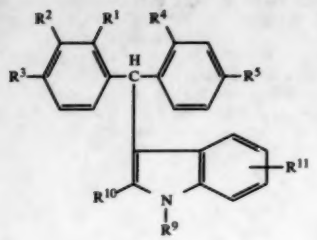
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,657

Int. Cl.³ B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **12 Claims**

1. A pressure-sensitive carbonless duplicating system or thermal marking system containing a support sheet coated with a layer containing a color-forming substance comprising a compound having the formula



wherein:

R^1 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, or halo;

R^2 represents hydrogen or nitro;

$R^{3'}$ represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, or nitro;

R^4 represents hydrogen, non-tertiary C_1 to C_4 alkyl, non-tertiary C_1 to C_4 alkoxy, halo or dialkylamino in which alkyl is non-tertiary C_1 to C_4 alkyl;

R^5 represents dialkylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^9 represents hydrogen, non-tertiary C_1 to C_{18} alkyl, C_2 to C_4 alkenyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

R^{10} represents hydrogen, C_1 to C_3 alkyl or phenyl; and

R^{11} represents one or two of hydrogen, C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halo or nitro.

4,403,792

NOVEL GLYCOLIC ACID ESTERS AND AMIDES OF BIS(P-DISUBSTITUTEDAMINOPHENYL)CARBINOL

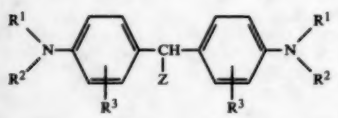
Frank F. Cesark, Bridgewater; Robert J. Manfre, Somerville, and Daniel W. Thomas, Bridgewater, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 256,353, Apr. 22, 1981, Pat. No. 4,343,939. This application Mar. 26, 1982, Ser. No. 362,367

Int. Cl.[3] **B41L** *1/20;* **B41M** *5/00*

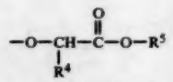
U.S. Cl. 282—27.5 **6 Claims**

1. A pressure-sensitive transfer copy set comprising a transfer sheet superimposed on an absorbent sheet, the transfer sheet having a coating on the surface thereof in contact with said absorbent sheet; said coating comprising a color former compound represented by the Formula (1):



(1)

wherein R^1 and R^2, which may be the same or different, represent hydrogen, alkyl containing from about 1 to 4 carbon atoms, which may be substituted by a nitrile, hydroxyl or a 2 to 8 carbon alkoxy group, phenyl or alkyl (C_1–C_4) substituted phenyl, benzyl or alkyl (C_1–C_4) substituted benzyl; R^3 represents hydrogen or alkyl containing about 1 to 5 carbon atoms; and Z represents an ester or amide group represented by Formula (2) and (3), respectively:



(2)

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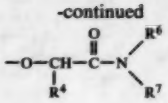


(3)

wherein R^4 represents hydrogen, alkyl containing about 1 to 5 carbon atoms, phenyl or alkyl (C_1–C_4) substituted phenyl, or benzyl or alkyl (C_1–C_4) substituted benzyl; R^5 represents alkyl containing about 1 to 12 carbon atoms, either in a straight or branched chain, which chain may be interrupted by a hetero atom, phenyl or alkyl (C_1–C_4) substituted phenyl, or benzyl or alkyl (C_1–C_4) substituted benzyl; R^6 and R^7, which may be the same or different, represent hydrogen, alkyl containing about 1 to 12 carbon atoms in either a straight or branched chain, which chain may be interrupted by a hetero atom, phenyl or alkyl (C_1–C_4) substituted phenyl, benzyl, or alkyl (C_1–C_4) substituted benzyl, or wherein R^6 and R^7, taken together with the nitrogen atom to which they are attached, combine to form a heterocyclic ring, which forms a colored image when brought into contact with an electron acceptor, and a material normally insulating said color former compound in said coating to prevent contact with said absorbent sheet but being rupturable upon the application of pressure on said transfer sheet, whereby said color former compound is released and contacts said absorbent sheet; said absorbent sheet having a coating on a surface thereof in contact with said transfer sheet, said coating containing an electron acceptor.

4,403,793

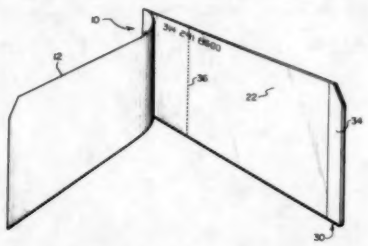
TRANSACTION SLIPS PACK

Joseph A. McCormick, Manhattan, Ill., and Lewis T. Hardin, Florissant, Mo., assignors to General Credit Forms, Inc., Earth City, Mo.

Filed Mar. 11, 1982, Ser. No. 357,182

Int. Cl.[3] **B42D** *15/00;* **B41L** *1/20*

U.S. Cl. 283—105 **5 Claims**



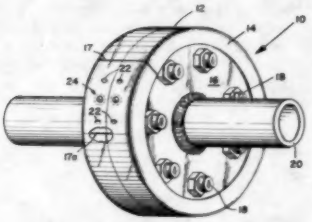
1. In a pack of credit card transaction slips for recording information thereon at defined positions on each transaction slip, including a customer position for receiving characters identifying a customer's account, said pack including at least two of said transaction slips with a duplicating carbon slip or duplicating medium slip therebetween joined at one end to said transaction slips and having an opposite free end, the improvement comprising a series of perforations in the form of a perforation strip placed on said duplicating slip at a location intermediate the joined end and the free end and adapted to align with the customer position on the transaction slips, enabling said characters identifying a customer's account, when recorded on said duplicating slip, to be split into two carbon sections by disjoining said duplicating slip at said perforation strip upon moving said one end away from said free end.

4,403,794

SAFETY SHIELD FOR FLANGED PIPE COUPLINGS

Donald G. Curran, Norwood, Pa., and Robert A. Anderson, Sewell, N.J., assignors to Bunnell Plastics, Incorporated, Mickelton, N.J.

Filed Jan. 28, 1981, Ser. No. 229,083
Int. Cl.³ F16L 47/00
U.S. Cl. 285—45 12 Claims



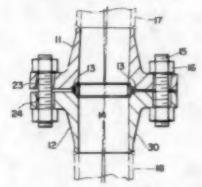
1. A safety shield for containing and deflecting a fluid leaking from a flanged pipe coupling comprising an elongated heat-shrinkable arcuate strip of transparent fluoropolymer, a flange along each longitudinal edge of said strip extending radially inward thereof, said flanges having been obtained by subjecting an annular section of heat-shrinkable tubing formed of said fluoropolymer to shrinking conditions while substantially restricting radial shrinkage thereof except along marginal edge portions of said section, said strip having a length sufficient to enable it to be wrapped around the circumference of the pipe coupling flanges to which it is applied, whereby one end of said strip overlaps the opposing end of said strip, and a width such that said flanges extend radially inward toward said pipe adjacent said pipe flanges, and means for coupling together the overlapping ends of said strip.

4,403,795

FLANGE UNION WITH IMPROVED RECESSED SEATS AND SEALING RING

Irwin H. Davlin, 714 S. Court St., Opelousas, La. 70570

Filed Dec. 9, 1980, Ser. No. 214,956
Int. Cl.³ F16L 27/06
U.S. Cl. 285—184 34 Claims



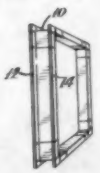
1. A flange union consisting essentially of first and second integrally constructed cooperating flange members having inner and outer ends and alignable annular bores extending longitudinally therethrough which serve as a passageway for fluid, the said first and second flange members having first and second annular recessed female seats respectively formed in their terminal inner end surfaces and extending around the terminal inner ends of the said bores, the said first and second female seats including first and second cooperating annular sealing surfaces which likewise extend around the said terminal inner ends of the bores, the said first and second flange members being positioned whereby their respective bores are in communication and the terminal inner end surfaces thereof are opposite each other whereby the said first and second female seats and the said first and second cooperating sealing surfaces thereon are in opposed relationship, a sealing ring having an annular convex sealing surface positioned between the said female seats, the said annular convex sealing surface of the sealing ring having a diameter greater than the internal diameters of the said bores and being located outside of the said bores, the said sealing ring being positioned whereby the said annular convex sealing surface thereof is in continuous contact with the said first and second opposed cooperating annular sealing surfaces of the first and second female seats, the configuration of the said convex sealing surface on the sealing ring and the said first and second sealing surfaces on the first and second female seats being such that an annular line seal of minimized surface area is formed outside of and surrounding the internal diameters of the said bores but being closely adjacent thereto, means carried by the said first and second flange members which includes means formed integrally therewith for applying inwardly directed forces to the said first and second opposed female seats to thereby urge the said first and second opposed sealing surfaces thereof into an effective sealing relationship with the said convex annular surface on the sealing ring and thereby form annular seals around the said terminal inner ends of each of the said bores and provide a fluid tight passageway for fluid through the flange union, the said inner ends being normally spaced apart a distance whereby when the first and second flange members are aligned and the said first and second sealing surfaces are in an effective sealing relationship with the said convex surface on the sealing ring the first and second flange members may be moved in and out of alignment, and means carried by the said first and second flange members for allowing the first and second flange members to move in and out of alignment and for preventing them from moving sufficiently far out of alignment to break the said annular seals, the last named means including a set of cooperating annular opposed projections extending from the said terminal inner ends of the first and second flange members, the said set of projections being outside of the said convex sealing surface on the sealing ring and normally being spaced apart longitudinally when the first and second flange members are properly aligned, and the said set of projections being positioned and arranged whereby they come into contact when the said first and second flange members are out of alignment a predetermined amount whereby the said projections serve as a stop means which prevents the said seal from being broken.

4,403,796

EXPANSION JOINTS

Stephen G. Ledbetter, Charleston; Michael P. Singleton, Goose Creek; Thomas J. Johns, Summerville, and James L. Fabian, Goose Creek, all of S.C., assignors to RM Industrial Products Company, Inc., North Charleston, S.C.

Continuation-in-part of Ser. No. 286,791, Jul. 27, 1981, abandoned, which is a continuation of Ser. No. 89,513, Oct. 30, 1979, abandoned. This application Aug. 26, 1982, Ser. No. 411,616
Int. Cl.³ F16L 33/00
U.S. Cl. 285—223 9 Claims



1. An expansion joint for connecting a pair of adjacent spaced ducts and the like in a fluid tight relationship, said expansion joint comprising a circumferentially continuous belt of flexible material and means for connecting said belt between said spaced ducts in a fluid tight relationship, said belt being

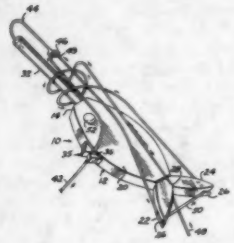
composed of a laminated sheet material comprising a layer of stretchable knit metallic wire mesh embedded on both sides with a cured fluoroelastomer sheet, said expansion joint being capable of recoverable elongation in excess of 75 percent and being capable of substantially continuous exposure to temperatures in the order of about 300 to about 400 degrees F. and excursions up to about 600 to about 700 degrees F. without substantial loss of flexibility.

4,403,797

FISHING LINE KNOT TYING TOOL

Ewing Ragland, Jr., 841 Scott, Del City, Okla. 73115

Filed Mar. 8, 1982, Ser. No. 355,980
Int. Cl.³ D03J *3/00*
U.S. Cl. 289—17 **4 Claims**



1. A hand held tool for tying a fishing line to the eye of a piece of fishing tackle, comprising:

an elongated planar body having a forward end and a rearward end;

a resilient projection protruding laterally from one side edge of the body and having a transverse slot therein normal to the plane of the body for frictionally holding an intermediate portionof a fishing line;

elongated tube means projecting longitudinally forward of the body for supporting a piece of fishing tackle and for threading a free end portion of a fishing line through the eye thereof and forming a forward doubled back line bight portion adjacent the tube and enable a free end portion of the line to be wrapped around the tube and doubled back line bight portion; and,

a pair of fins diverging rearwardly from the rearward end and in the plane of said body;

said fins each having a pointed rearward tip end transversely slotted parallel with the plane of the body for frictionally holding an intermediate portion of the fishing line when strung therebetween forming a rearward line bight portion defining an opening in combination with the rearward fins through which a free end portion of the fishing line is passed.

4,403,798

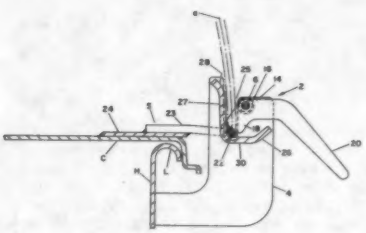
LATCH ASSEMBLY FOR RAILWAY CAR HATCH COVER

Robert J. Smith, Lansing, Mich., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Jun. 15, 1981, Ser. No. 273,998
Int. Cl.³ E05C *3/14*
U.S. Cl. 292—256.5 **3 Claims**

1. A latch assembly for locking in place one end of a hold-down strap that secures a railway car hatch cover to a hatch frame, said latch assembly including a latch support means connected to said hatch frame, a latch member pivotally connected about a substantially horizontal axis to said latch support, said latch member having on one side of said pivot axis a latching portion engageable with said end of said hold-down strap and a counterweight portion on the other side of said pivot axis, said latching portion being positioned to swing downwardly and out of the way of said end of said hold-down strap in response to engagement by said hold-down strap end during the downward travel of said strap end, said counterweight portion being positioned to drop under the force of gravity when said hold-down strap end has moved to a position below said latching portion, so as to rotate said latch member and cause said latching portion to swing upwardly and over said hold-down strap end to prevent the return, upward movement of said hold-down strap, characterized by the improvement comprising:

a. a latch bar forming said end of said hold-down strap, said latch bar extending substantially parallel to said pivot axis of the latch member, and means connecting said latch bar to the remaining portion of said hold-down strap and holding said latch bar spaced from said remaining portion of said hold-down strap; and



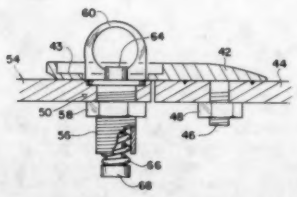
b. a hinge seat mounted on said latch support and located adjacent the position of said latch bar when said latching portion has swung over said bar to prevent the return, upward movement of said hold-down strap, said hinge seat extending around the side of said latch bar opposite from the side engaged by said locking portion of said latch member, so such extent that any space between said hinge seat and said latching portion on either side of said latch bar is too small for passage of said latch bar, said hinge seat and latching portion thus hinging said latch bar to said hatch frame and allowing said hold-down strap to be pivoted about said latch bar when the opposite end of said hold-down strap is unlatched.

4,403,799

FLUSH HASP HAVING FOLDABLE, UPSTANDING LATCHING PORTION, AND OPTIONALLY USABLE WITH PADLOCK

Robert S. Kafka, Maitland, and Charles F. Kafka, Bradenton, both of Fla., assignors to Meacham Marine Products, Inc., Sarasota, Fla.

Filed Aug. 6, 1980, Ser. No. 175,651
Int. Cl.³ E05C *19/08*
U.S. Cl. 292—285 **5 Claims**



1. A flush hasp especially adapted for marine use, said hasp having a base portion, and a portion movable toward and away from engagement with said base portion, said movable hasp portion having an aperture therein, and said base portion having a rotatable member adapted to enter said aperture when

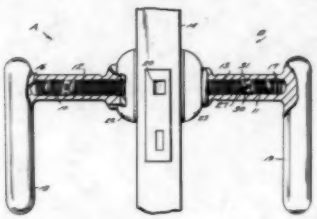
said movable hasp portion has been moved into contact with said base portion, said rotatable member adapted to be manually rotatable between a position aligned with said aperture, in which engagement and disengagement of said portions is readily permitted, and a latched position in which said rotatable member serves to inhibit removal of said movable hasp member from contact with said base portion, and locking means for preventing on occasion, said rotatable member from being moved away from a motion-inhibiting position, said rotatable member including a closed loop designed to receive the shackle member of a padlock, said closed loop being mounted so as to be readily moved into a relatively flat, nonprotruding position when a padlock is not being used therewith, in order to lessen the likelihood of someone tripping thereover.

4,403,800

DOOR HANDLE ASSEMBLY

Desmond H. Ward, 3071 Woodside Dr., Jackson, Miss. 39212

Filed Apr. 24, 1981, Ser. No. 257,119
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—350 **12 Claims**



1. An assembly for fixedly interconnecting a pair of door handles of the type requiring a specific normal predetermined orientation and for transmitting a turning movement in one direction applied to either of said door handles to a door latch mechanism to release the same, said assembly comprising:

an elongated spindle including a first male threaded end portion threadingly engaged within a first female threaded cavity of a first door handle, and a second male threaded end portion threadingly engaged within a second female threaded cavity within a second door handle, and a central portion engaged with the door latch mechanism in motion transmitting relationship therewith;

a first male threaded member threadingly engaged within said first female threaded cavity of said first door handle;

first means on one end of said first member defining surfaces for mating with a turning tool so that said first member can be threadingly engaged within said first female threaded cavity at a predetermined depth therein corresponding to the normal predetermined orientation of said first door handle with respect to said spindle;

first interengaging surface means on the terminal end of said first end portion of said spindle and on said one end of said first member engageable during the turning movement of said spindle with respect to said first door handle so that said first interengaging surface means are wedgingly engaged in rigid association by virtue of the threaded connections of said first spindle end portion and said first member with said first door handle therewith for preventing the transmission of turning movement of said spindle to said first member thereby insuring that said first handle will be normally maintained in said normal predetermined orientation;

a second male threaded member threadingly engaged within said second female threaded cavity of said second door handle,

second means on one end of said second member defining surfaces for mating with a turning tool so that said second member can be threadingly engaged within said second female threaded cavity at a predetermined depth therein corresponding to the normal predetermined orientation of said second door handle with respect to said spindle; and

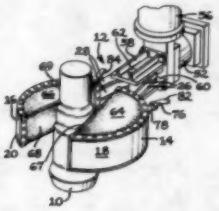
second interengaging surface means on the terminal end of said second end portion of said spindle and on said one end of said second member engageable during the turning movement of said spindle with respect to said second door handle so that said second interengaging surface means are wedgingly engaged in rigid association by virtue of the threaded connections of said second spindle end portion and said second member with said second door handle therewith for preventing the transmission of turning movement of said spindle to said second member thereby insuring that said second handle will be normally maintained in said normal predetermined orientation.

4,403,801

CLAMP ASSEMBLY

Edward R. Huff, Washington, and Hubert H. Warner, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US81/00225, § 371 Date Feb. 24, 1981, § 102(e) Date Feb. 24, 1981, PCT Pub. No. WO82/02872, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 24, 1981, Ser. No. 277,753
Int. Cl.³ B66C *1/46*
U.S. Cl. 294—93 **4 Claims**



1. A clamp assembly (12) for controllably gripping an article, comprising:

a pair of opposed frame members (14,16) each including a rigid wall portion (18,20) and a support arm (26,28), each of said support arms (26,28) having a first end (30,32) attached respectively to one of said rigid wall portions (18,20) and a second end (34,36) spaced from said first end (30,32), said support arms (26,28) being pivotally interconnected at a point intermediate said first (30,32) and second ends (34,36) and said frame members (14,16) being pivotally movable about said point between a first position at which the frame members (14,16) are spaced apart and a second position at which the frame members (14,16) are adjacently disposed with respect to one another;

means (44) for pivotally moving said frame members (14,16) between said first and second positions;

a pair of pressurizable gripping members (64,66), each having a compliant article-contacting surface (67,68) and being respectively attached to said frame members (14,16); and

means (76) for controllably pressurizing at least one of said gripping members (64,66).

4,403,802

TRAILER UNIT

Russell P. Jones, 6958 Bradshaw, Sacramento, Calif. 95826

Filed May 12, 1980, Ser. No. 148,941
Int. Cl.³ B62D *25/20*; B60P *3/32*
U.S. Cl. 296—25 **14 Claims**

1. A trailer unit comprising, in combination:

a frame,

an enclosure on said frame for accommodating at least one individual,

means for detachably coupling said frame to a towing vehicle such as a truck or the like,

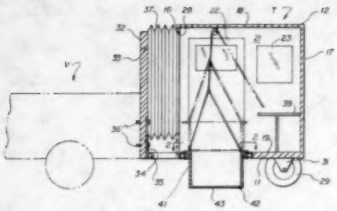
means on said frame for supporting said trailer unit for travel on the ground,

said enclosure having a floor, side walls and a roof defining an interior,

said enclosure floor having an opening,

platform means disposed in said opening for vertical movement between an elevated travel position within said enclosure and a lower position within said enclosure including sealing means on said frame for sealing engagement with said platform means, said sealing means comprises elongated tubular gaskets of resilent material on said frame within said floor opening adjacent said platform means and releasable means for urging said gaskets into sealing engagement with said platform means wherein said releasable urging means comprises elastic cords each having free ends, one of said elastic cords extending through one of said gaskets adjacent said platform means and means on said frame opposide said platform means for detachable engagement with said one elastic cord free ends to tension said one cord for urging said gaskets into sealing engagement with said platform means,

and means for lifting said platform means from said lower operative position into said elevated travel position.



4,403,803

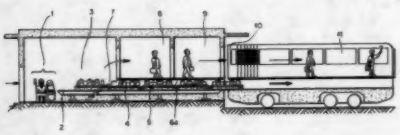
PASSENGER AND LUGGAGE TRANSFER SYSTEM

Valer Szendrödi; Gyula Radics; Tivadar Varga; Tibor Vass, and Karoly Gyurics, all of Budapest, Hungary, assignors to Ikarus Karosszeria es Jarmügyar, Budapest, Hungary

Continuation-in-part of Ser. No. 107,660, Dec. 27, 1979, Pat. No. 4,355,840. This application May 7, 1981, Ser. No. 261,644

Int. Cl.³ B64F *1/31*

U.S. Cl. 296—179 15 Claims



1. An airport boarding and deplaning bus, comprising an elongated self-propelled vehicle body formed with a passenger compartment extending at least over a major portion of the length of said body, a driver compartment at a front end of said body and an elevatable stairway adjacent said driver compartment at said front end of said body, said elevatable stairway comprising a doorway adapted to be disposed substantially in alignment with said passenger compartment during travel of the bus but elevatable with said stairway for alignment with a doorway of an aircraft, said elevatable stairway comprising a step most distal from said passenger compartment and formed at the bottom of said doorway of the bus, a succession of other steps of generally similar width lying between said distal step and said passenger compartment, means interconnecting said steps whereby elevation of said distal step will successively raise the steps disposed successively inwardly from said distal step toward said passenger compartment; and means for shifting said distal step on said body substantially vertically to raise said steps and the doorway of said bus and thereby form a staircase running between said passenger compartment and said doorway of said aircraft at said front end of said body adjacent said driver compartment.

4,403,804

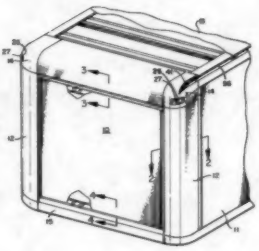
TRUCK OR TRAILER BODY CONSTRUCTION

Elton Mountz, Morgantown; Paul Whiteman, East Earl; Roy C. Higginson, Honeybrook, and Marlin W. Hacker, Gleanmoore, all of Pa., assignors to Morgan Trailer Mfg. Co., Morgantown, Pa.

Filed Apr. 12, 1982, Ser. No. 367,401

Int. Cl.³ B62D *33/00*

U.S. Cl. 296—183 6 Claims



1. A front portion for a truck or trailer body for reducing dynamic drag which comprises

an outer central panel section,

outer curved corner plates along the vertical sides of the panel section,

outer side panels extending rearwardly from said corner plates,

a roof section,

an upper curved plate extending from the central plate section to the roof section, and

means including a plurality of supporting members interposed between said outer central panel and said side panels for supporting said corner plates,

said last means comprising vertical supporting members having sockets for the reception for marginal edges of said curved plates.

4,403,805

SLIDING SUNROOF WITH POWER OPERATED VENTILATOR

Ervin H. Strem, Jr., Warren, and Gary L. Van Hulle, Woodhaven, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 6, 1982, Ser. No. 337,474

Int. Cl.³ B60J *7/04*

U.S. Cl. 296—221 4 Claims

1. A vehicle body sunroof comprising:

a roof panel having a roof opening;

a carrier frame adapted to underlie the roof panel around the edge of the roof opening and having a carrier frame opening therein;

a closure panel having a forward end pivotally mounted on the carrier frame so that the closure panel is pivotally movable between a closed position closing the carrier

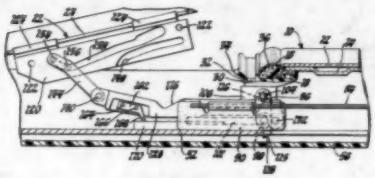
frame opening and an angularly raised ventilating position;

a track extending alongside the roof opening;

a guide block movable along the track by a drive mechanism;

a lifter link pivotally connected to the rear end of the carrier frame and having a vertical upstanding position closing the carrier frame against the roof panel;

means connecting the lifter link to the guide block to move the lower end of the lifter link rearwardly upon rearward guide block movement so that the lifter link collapses to



lower the carrier frame below the roof panel and then moves the carrier frame rearwardly to open the roof opening, said connecting means also permitting forward movement of the guide block while the lifter link remains poised at the vertical upstanding position closing the carrier frame against the roof opening; and

means interconnecting the guide block and the rearward end of the closure panel and adapted to pivot the closure panel to the angularly raised ventilating position upon forward movement of the guide block subsequent to the lifter link having attained the vertical upstanding position.

4,403,806

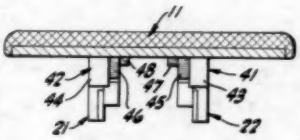
GOLF SEAT

Alex Stephen, 2130 El Camino, Turlock, Calif. 95380

Continuation-in-part of Ser. No. 2,898, Jan. 12, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 74,873

Int. Cl.³ A47C 7/62

U.S. Cl. 297—217 **4 Claims**



1. A portable seat adapted for removable mounting upon the tire of a golf cart wheel comprising a seat,

a rigid plate having an upper surface comprising a seat,

a first pair of projections depending from the under side of said plate with each projection having like inner surfaces inclined longitudinally thereon and abutting an outer vertical wall with said walls being spaced apart a predetermined distance substantially equal to the width of a golf cart tire, and

a second pair of projections depending from the under side of said plate in spaced relation to said first pair longitudinally of said plate and comprising substantially mirror images of said first pair, with the inclined surfaces of said pairs sloping upwardly toward each other, whereby

said projections are adapted to engage a golf cart tire with the inclined surfaces engaging the tire periphery and the walls engaging the sides of the tire to removably mount the seat thereon.

4,403,807

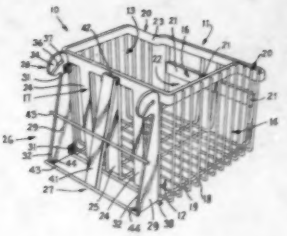
BABYSEAT ATTACHMENT FOR SHOPPING CART

Dawn G. Wilkinson, Rte. #1, Box 403, Fennville, Mich. 49408, and John D. Brush, Casco Township, Allegan County, Mich., assignors to Dawn G. Wilkinson, Fennville, Mich.

Filed Sep. 30, 1980, Ser. No. 192,168

Int. Cl.³ A47C 31/00

U.S. Cl. 297—217 **10 Claims**



1. A baby carrier detachably mountable on a wheel-supported vehicle, comprising a seat assembly having downwardly converging side walls, a bottom wall extending between the lower edges of said side walls, and a pair of horizontally spaced leg openings in one of said walls; means for detachably supporting said baby carrier on said wheel-supported vehicle; and leveling means for maintaining said bottom wall substantially horizontal when said baby carrier is detachably supported on said wheel-supported vehicle, including at least one bearing member supported for movement between a retracted position adjacent one said side wall of said seat assembly for facilitating nested stacking of said baby carrier with similar carriers and a leveling position spaced from said one side wall for effecting said leveling of said bottom wall, and including spacer means cooperable with said one side wall and said bearing member for maintaining said bearing member and said one side wall in said spaced relationship when said bearing member is in said leveling position, said spacer means including a pair of horizontally spaced spacer elements, each supported on said one side wall for pivotal movement about an axis parallel to and adjacent said one side wall between a retracted position disposed against said one side wall generally parallel thereto and a leveling position substantially perpendicular to said one side wall; wherein said bearing member is a substantially horizontal rod; and wherein said spacer elements each have a portion of substantially triangular shape having one edge disposed against said one side wall coincident with said pivot axis and a second edge converging upwardly therewith, and including two said bearing members and a support member having one end supported on the upper portion of said one side wall intermediate said spacer elements for pivotal movement about a substantially horizontal axis, said bearing members being parallel to each other and perpendicular to said support member and being rigidly mounted to said support member at locations spaced from each other and from said one end, said bearing members being disposed against said second edges of said spacer elements when said spacer elements and said bearing members are in said leveling position, and one of said bearing members having means thereon for maintaining said spacer elements in said leveling position when said bearing members and said spacer elements are in said leveling position.

4,403,808
HAULING AND SHAVING PLANT

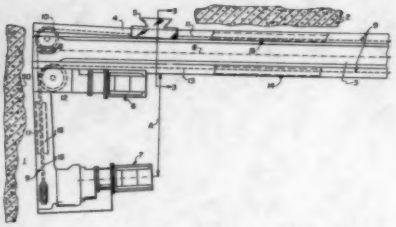
Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach and Braun, Fed. Rep. of Germany

Filed Aug. 29, 1980, Ser. No. 182,801

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936819

Int. Cl.³ E21C *27/32*

U.S. Cl. 299—34 **5 Claims**



1. A hauling and planing plant for underground mining of a mining face, particularly a coal face which is adjacent a rock face and disposed at an angle thereto, comprising a longwall conveyor section adapted to be positioned alongside the coal face, a plane guide associated with said longwall conveyor, a plane movable along said plane guide, a plane chain guide associated with said longwall conveyor, a plane chain connected to said plane and movable along said guide, a rock wall section extending at an angle from said longwall conveyor along a head zone, a hauling chain having a pulling strand and a return strand guided along said longwall conveyor, a plane chain and hauling chain drive unit connected to said hauling chain and said plane chain and arranged adjacent said rock wall section, said longwall conveyor including at least one deflecting pulley over which said hauling chain pulling strand is directed and at least one return pulley over which said hauling chain pulling strand is directed located adjacent said rock wall section, means defining a return channel in said longwall conveyor in which said return strand is guided adjacent said rock face end, and a chain channel in said rock wall section extending at an angle to said longwall conveyor along said rock face in which said pulling strand is directed, said driving unit for said shaving chain being arranged in said rock section at a selected spacing from said longwall conveyor.

4,403,809
MINERAL WINNING PLOUGH

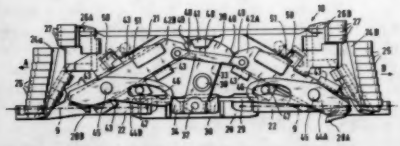
Alois Hauschopp, Werne; Oswald Breuer, Dortmund, and Bernd Steinkuhl, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,340

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1980, 3041485

Int. Cl.³ E21C *27/32*

U.S. Cl. 299—34 **22 Claims**



1. A mineral winning plough having a plough body adapted to be moved to and fro alongside a mineral face on a plough guide, the plough body being provided with a pair of vertically-adjustable carriers each of which is provided with floor cutter means, and the plough body being provided with setting means for raising and lowering the carriers into rest and working positions respectively, the setting means comprising a setting member and an intermediate member, the setting member being mounted on the plough body for limited movement relative thereto, and being attachable to a plough drive chain, and the intermediate member forming a mechanical operative connection between the setting member and the two carriers, wherein the intermediate member is rotatably mounted on the plough body and is positioned between the two carriers, the arrangement being such that movement of the setting member relative to the plough body in a given direction forces one of the carriers to be lowered into its working position, and causes the other carrier to be raised into its rest position.

4,403,810
COUPLING FOR TRIPARTITE INJECTION OR COMPRESSION MOLD

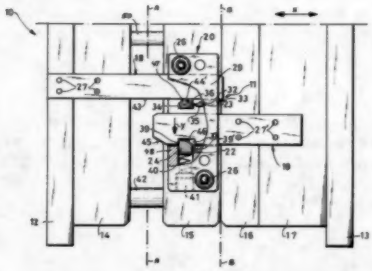
Gunther Bieneck, Langgöns, Fed. Rep. of Germany, assignor to Hasco-Normalien Hasenclever & Co., Lüdenscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 223,839, Jan. 9, 1981, abandoned. This application Sep. 4, 1981, Ser. No. 299,644

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, 3000798

Int. Cl.³ B29F *1/00*; B29C *1/16*

U.S. Cl. 425—589 **6 Claims**



1. In a tripartite mold comprising a first outer plate, a second outer plate and an intermediate plate sandwiched between said outer plates, said plates having contact surfaces perpendicular to a direction of relative motion,

the combination therewith of coupling means for enabling two-stage separation of said plates from one another after the molding of a workpiece in a mold-closed position in which said plates are in mutual contact, said coupling means comprising:

a control bar rigid with said first outer plate extending transversely to said contact surfaces toward said second outer plate;

a locking bar rigid with said second outer plate extending parallel to said control bar toward said first outer plate;

a transverse guide block on said intermediate plate with a channel forming a track parallel to said contact surfaces, said channel intersecting two parallel passages in said guide block that are traversed by said bars with limited lateral play in said mold-closed position;

a generally U-shaped detent member slidable in said channel transversely to said direction of motion, said detent member having a first and a second leg straddling said locking bar, said first leg being provided with a beveled face confronting said second outer plate, said control bar having a camming face paralleling said beveled face, said

second leg having an angular cross-section and being positively engageable by a transverse shoulder of said locking bar whose width exceeds said play and which faces away from said first outer plate, said shoulder being coplanar with a transverse face of said second leg in said mold-closed position, said control bar extending past said detent member in said mold-closed position with said camming face spaced from said beveled face by a certain distance in the direction of said second outer plate; and

spring means effective in said mold-closed position to urge said detent member into latching engagement of said transverse face with said shoulder for preventing separation of said intermediate plate from said second outer plate, with said beveled face lying in the path of said camming face whereby relative displacement of said outer plates away from each other by said certain distance causes said camming face to repress said detent member through said beveled face against the force of said spring means with resulting disengagement of said second leg from said locking bar and separation of said intermediate plate from said second outer plate upon further relative displacement of said outer plates.

4,403,811

APPARATUS FOR HANDLING LOADS BY MEANS OF A BALL BEARING-MOUNTED TABLE

Jean-Benoit Dussud, 12 rue Champ Rochas, 38240 Meylan, France

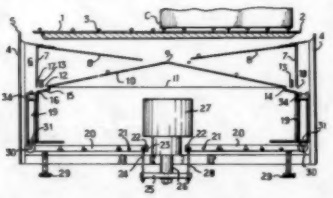
Filed Dec. 29, 1980, Ser. No. 220,700

Claims priority, application France, Jan. 14, 1980, 80 00688

The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **10 Claims**



1. Load-handling apparatus, comprising a table having a horizontal plate on which ball bearings roll freely, a gully along the side of the table and a means for returning to the plate any ball bearings which have fallen into the gully, wherein said means for returning ball bearings comprises an elevating means, the movement of which is such as to prevent the ball bearings from continuing beyond substantially the level of the plate and which is provided with means for emptying the ball bearings onto the plate as the ball bearings reach substantially the level of the plate.

4,403,812

RADIAL BEARING ASSEMBLY

Gerard Stephan, Croissy, France, assignor to Nadella, France

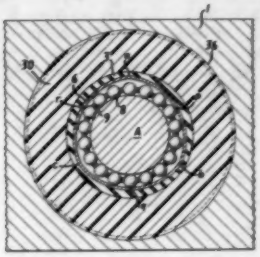
Continuation of Ser. No. 272,289, Jun. 10, 1981, abandoned, which is a continuation of Ser. No. 38,847, May 14, 1979, abandoned. This application Jun. 1, 1982, Ser. No. 383,621

Claims priority, application France, May 23, 1978, 78 15228

Int. Cl.³ F16C *27/06*

U.S. Cl. 308—184 R **12 Claims**

1. A radial rolling bearing assembly with play take-up of the type comprising a sleeve of an elastomer within which is engaged an elastically deformable thin metal ring whose internal surface defines an outer race for cylindrical rolling elements to which the ring offers, on assembly, a reduced circulation clearance at angularly spaced zones; the improvement comprising a sheath encircling said sleeve and made of a plastics material which is harder and less elastic than the elastomer of said sleeve and has a radial thickness which is greater than the



combined radial thickness of said sleeve and ring so that said sheath principally determines the overall radial size of the bearing assembly.

4,403,813

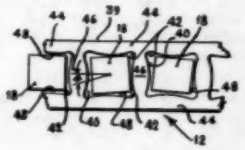
ROLLER BEARING CAGE DESIGN

James R. Schaefer, Juno Isles, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 14, 1981, Ser. No. 311,379

Int. Cl.³ F16C *33/46*

U.S. Cl. 308—207 R **4 Claims**



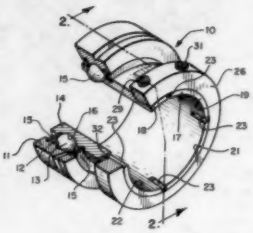
2. In a high speed anti-friction roller bearing having an outer ring, an inner ring having a pair of spaced apart guide rails, a plurality of rollers interposed between said outer ring and said inner ring and positioned between said guide rails, each of said rollers having an acceptable initial skew angle determined by said roller and said guide rail geometry, the improvement therein being in the form of a roller cage interposed between said outer ring and said inner ring and encompasing said rollers, said cage comprising an annular-shaped element, said element having a plurality of spaced apart openings therein, each of said openings being defined by a pair of side rails and a pair of cross rails, each of said rollers being positioned within a separate one of said openings, respectively, each of said side rails and said cross rails being of a convex configuration adjacent said rollers, said convex configuration having a curvature of predetermined size, and said side rails and said cross rails joining each other to form four concave corners, each of said concave corners being of a radius of predetermined size, said predetermined size of said curvature of said convex side rails and said cross rails and said predetermined size of said radius of each of said corners being established such that contact by said rollers at said corners of said cage will not occur until after wear between said rollers and said guide rails has developed to such an extent that said acceptable initial skew angle of said rollers is exceeded.

4,403,814

METHOD FOR LOCKING AN ANTI-FRICTION BEARING TO A SHAFT AND APPARATUS FOR ACCOMPLISHING THE SAME

William H. Koss, Waukesha, Wis., and Richard J. Smith, Valparaiso, Ind., assignors to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Jan. 25, 1982, Ser. No. 342,129
Int. Cl.³ F16C *35/06*
U.S. Cl. 308—236 **7 Claims**



4. In an anti-friction bearing having outer and inner race rings rotatable relative to one another, with said inner race ring having an axially slotted and correspondingly segmented axial extension integral therewith with at least four such slots and at least four intervening segments therein defined by said slots, the improvement comprising:

(a) means for centering a shaft in said axial extension and securing such a shaft therein against axial and rotational movement with respect to such inner race and integral axial extension on said inner race, said means comprising:

(b) a continuous ring collar around said integral axial extension having two set screws threadably maintained therein and spaced apart within an angle measured in a radial direction from an axial center of a shaft in said inner race which subtends an arc of substantially between 30° to 60°, with said ring collar being circumferentially positionable on said axial extension and with said two set screws being spaced apart therein so that when said collar is in position for securing a shaft and said axial extension together each said set screw is then over a corresponding segment, with such two segments being adjacent one another and having a slot between the same, and with each said set screw being spaced circumferentially away from said slot a substantially equal distance in opposite circumferential directions from one another;

(c) two radially extending threaded bores accommodating the respective two set screws in said collar, with each said set screw being tightenable into its threaded bore to engage its corresponding segment and move said segment into engagement with a side of a shaft when a shaft is positioned in said inner race while said collar engages two segments of said integral extension on the opposite side of said extension and shaft to move the latter two segments radially into engagement with said shaft on said opposite side, all said moved segments acting to position a shaft concentrically in said integral axial extension and to engage and secure such a shaft against axial and rotational movement relative to said inner race.

4,403,815

KNOCK DOWN PROJECTION TELEVISION CABINET

Virgil S. Runco, 878 Wharf Side, San Mateo, Calif. 94402

Filed Jan. 12, 1981, Ser. No. 224,305
Int. Cl.³ A47B *81/06*; H04N *5/74*
U.S. Cl. 312—7.2 **12 Claims**

1. A knock down projection television cabinet comprising:

a plurality of planar panel members provided with knock down fastener pairs of the type including a first fastener and a second fastener removably engagable with said first fastener,

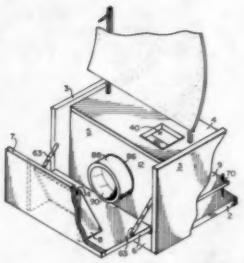
said panel members being assemblable into an enclosure having a hinged front drawer and being disassemblable for flat, compact storage and shipment, the panel members including

a base panel member having opposing left and right side edges, said opposing edges of said base panel member each being provided with at least one of said first fasteners,

a support panel member and attachment means for attaching said support panel member to an upper surface of said base panel member, whereby a television image source may be supported upon said support panel,

a front panel member provided with a centrally located aperture and having opposing left and right edges, said opposing edges of said front panel member each being provided with at least one of said first fasteners,

a hinged panel member having opposing left and right edges and a top edge, said opposing edges of said hinged panel member and said top edge being provided with at least one of said first fasteners, said hinged panel member including a lower sub-panel, an upper sub-panel, and hinge means attaching said upper sub-panel and said lower sub-panel together, said lower sub-panel being attached to said left side panel and said right side panel, and said upper sub-panel being attached at approximately right angles to said drawer front panel,



a top panel member having opposing left and right edges, each of said opposing edges of said top panel member being provided with one of said first fasteners,

a left side panel member having an inner surface provided with a plurality of said second fasteners for removably engaging said first fasteners of said left edges of said base panel member, said front panel member, said top panel member, and said hinged panel member,

a right side panel member having an inner surface provided with a plurality of said second fasteners for removably engaging said first fasteners of said right edges of said base panel member, said front panel member, said top panel member, and said hinged panel member, and

a drawer front panel member having an inner surface provided with a plurality of said second fasteners for engaging said first fastener of said top edge of said hinged panel member;

a lens assembly disposed through said aperture in said front panel;

mirror means removably attached to at least one of said hinged panel member and said drawer front panel member;

a projection screen; and

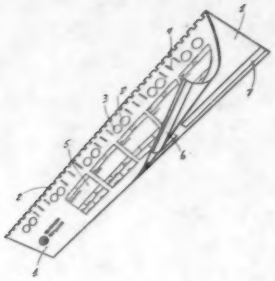
screen support means removably attached to said top panel member and to said projection screen.

4,403,816

SYSTEM OF VERTICAL FILING OF ARTICLES IN SHEETS AND MEANS EMPLOYED THEREFOR

Nelson Da Cruz Garcia, Rua Antonio Braune, 187/233-Rio de Janeiro, BJ, Brazil

Filed Nov. 7, 1980, Ser. No. 204,991
Claims priority, application Brazil, Nov. 8, 1979, 7258
Int. Cl.³ A47B 63/00; E05C 19/16
U.S. Cl. 312—184 4 Claims



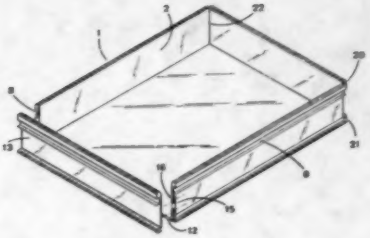
1. A system for filing sheet articles such as maps, engineering drawings and the like vertically, said system comprising a suspender comprising a pair of blades, said blades being elongated and in juxtapositioned and overlying relation to each other, said pair of blades being formed of a single strip of tape-like material folded in half along its length, and said strip being formed essentially entirely of non-magnetic material, said suspender being positioned with its length generally horizontal in use, means to join said blades together along upper horizontal zones thereof and along their length, hanger means formed in said upper zones of said blades, the remainder of said blades below said upper zones comprising lower zones and article supporting means, said lower zones of said blades being separable from each other over their entire length, magnetic means and means to mount said magnetic means on both of the facing surfaces of said lower zones of said blades, said magnetic means comprising a magnetic tape mounted on the lower zone of one of said blades and a non-magnetized metallic plate mounted on the lower zone of the other of said blades and in facing relation to said magnetic tape over substantially all of said lower zone, said magnetic means being sufficiently magnetically strong so as to tightly grasp an edge portion of an article therebetween and to support the entire weight of said article by said edge portion, means formed in said upper zones to permit said suspender with or without an article supported therein to be hung and filed, said last mentioned suspender filing means comprise holes formed in said upper zones, said holes being defined entirely within said upper zone and being free of any access slits or the like and adapted to cooperate with a plurality of pin means for hanging said suspender vertically, wherein said holes are formed in pairs spaced from each other and arranged on a line parallel to the length of said suspender, whereby in use said lower blade zones are separated from each other by normally overcoming the magnetic attraction of said magnetic means holding said lower zones of said blades together, an edge portion of an article to be filed is placed between the opened up lower blade zones and said lower blades zones are reclosed via said magnetic means to thereby grasp said article edge portion therebetween, and whereby said article edge portion is grasped solely by said magnetic means and is free of any damage as could be caused by glue, staples and the like heretofore used to mount sheet articles on vertical suspenders.

4,403,817

DRAWER FOR FURNITURE

Fernando H. Aidar, Sao Paulo, Brazil, assignor to Encatex S.A. Industria e Comercio, Sao Paulo, Brazil

Filed Mar. 23, 1981, Ser. No. 246,326
Claims priority, application Brazil, Mar. 31, 1980, 6000363
Int. Cl.³ A47B 88/00
U.S. Cl. 312—330 R 6 Claims



1. A drawer for furniture, comprising:

(a) side and rear vertical walls each formed of sheet metal having an intermediate vertical wall portion, a bottom portion extending perpendicularly outward from the bottom end of the vertical wall portion and thence downward, inward and upward, terminating a spaced distance below the bottom end of the vertical wall portion to provide therebetween an inwardly facing recess for reception of a drawer bottom, and a top portion extending outward and downward from the upper end of vertical wall portion, thence inward, downward and outward to provide an outwardly facing recess for reception of a drawer support rail in said recess of each side wall,

(b) a drawer bottom retained in said inwardly facing recesses, and

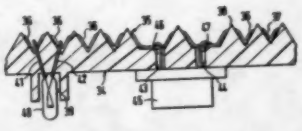
(c) a front wall secured to the front ends of said side walls.

4,403,818

INSTRUMENT PANEL FOR VEHICLES

Helmut Kleinböhl, Riedstadt, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 3, 1981, Ser. No. 269,879
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023905
Int. Cl.³ B60K 37/00; H01R 33/00
U.S. Cl. 339—10 2 Claims

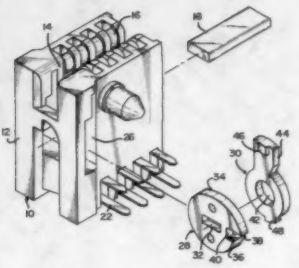


1. A vehicle instrument panel comprised of an insulating plastics material supporting individual indicating and control elements on the front side thereof and electric current paths on the rear side leading to the said elements, the rear side of the panel being corrugated or toothed to define a plurality of triangular cross-section grooves running in the direction of the desired paths, the grooves having apexes and flanks, and electrically conductive material coating the flanks of the grooves to form the current paths.

4,403,819
EDGE BOARD LOCK

Robert N. Weber, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 20, 1981, Ser. No. 323,210
Int. Cl.[3] H01R *13/62*
U.S. Cl. 339—75 MP 4 Claims



1. In combination with a zero insertion force edge board connector having an elongated housing defining an elongated circuit board receiving groove, a plurality of terminals mounted in fixed spaced relationship along at least one side of said groove, an elongated rotary cam member extending along the bottom of said groove and a cam follower mounted in said groove adapted to be driven by said cam member so as to drive said terminals between engaged and disengaged positions, a board lock preventing access to and egress from at least one end of said groove, said board lock comprising:

a hub member having an axial aperture profiled to receive said cam member therein in driving engagement, and first and second radially spaced lugs extending axially from one side surface of said hub member, and

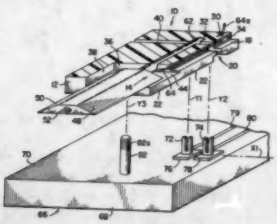
a locking member having a central aperture profiled for free rotation on said cam member therein, a first radially directed arm of sufficient length to block said groove of said connector housing and an oppositely directed lug,

whereby rotary movement of said cam drives said hub member until one of said radially spaced lugs engages the lug of the locking member to drive it between a first position with said ram arm blocking an end of said housing groove and a second position with said arm free of said housing groove.

4,403,820
CONNECTOR FOR TERMINATING UNDERCARPET SIGNAL TRANSMISSION CABLE

Donald S. Rich, Long Valley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 5, 1980, Ser. No. 213,310
Int. Cl.[3] H01R *13/38*
U.S. Cl. 339—97 R 30 Claims



1. An electrical connector for terminating an electrical cable assembly of type having a protective body and an electrically insulated conductor extending through and beyond said body, said connector comprising:

(a) a first housing for supporting said body and such extending insulated conductor, said first housing defining an inlet passage for receiving said body and a guide passage communicating with said inlet passage for receiving said insulated conductor, said first housing defining a contact-receiving passage accessible exteriorly of said first housing and extending transversely therein into such conductor-receiving passage;

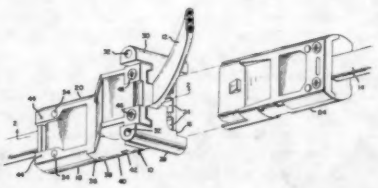
(b) a second housing joinable to said first housing and having an exterior surface supporting an insulation-piercing contact; and

(c) housing interconnect means for joinder of said first and second housings and operably responsive to mechanical input for both applying strain-relieving force to said body and forcing said contact into electrical engagement with said conductor through said contact-receiving passage.

4,403,821
WIRING LINE TAP

John A. Zimmerman, Jr., Hershey, and William B. Long, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 17,632, Mar. 5, 1979, abandoned. This application Mar. 4, 1981, Ser. No. 240,523
Int. Cl.[3] H01R *25/06*
U.S. Cl. 339—97 P 8 Claims



1. A power cable tap device for removably joining a secondary circuit to a primary cable run, said device comprising:

a housing of insulative material having a base member and a cover member, said base member and said cover member together defining therebetween a single power cable passage extending from one end of said housing to the other end and having offset parallel portions at the opposite ends thereof, a mating face on said base member adapted to receive a mating connector member terminating a tapping cable, at least two terminal passages in said base member intersecting said cable passage, extending parallel to at least a portion thereof and opening on said mating face;

at least two terminals each mounted in a respective terminal passage of said base member, each said terminal having a conductor engaging first end lying in said terminal passage directed toward said mating face;

whereby a power cable positioned in said cable passage is terminated by said terminals and a tap effected by engaging a mating connector member to said terminals at said mating face.

4,403,822

ELECTRICAL PROBE APPARATUS

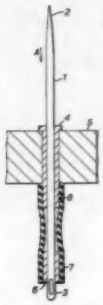
John L. Smith, St. Albans, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Jul. 29, 1980, Ser. No. 173,368

Claims priority, application United Kingdom, Jul. 31, 1979, 7926635

Int. Cl.³ H01R *13/24*; G01R *1/06*

U.S. Cl. 339—108 TP 11 Claims



1. An electrical probe apparatus comprising: a plurality of elongate electrically conductive probes; an apertured member in which said probes are slidably mounted, with one end of each said probe projecting from said member; and a plurality of resiliently deformable tubular sleeves each surrounding a portion of a respective one of said probes, with one end of each said sleeve being secured to a respective one of said probes and the other end of each said sleeve being secured to said member so as to form a gas tight seal between said one end of each said probe and said member, wherein when said apparatus is in use said plurality of probes can simultaneously contact a number of circuit points.

4,403,823

ELECTRICAL CONTACT FOR POSITION MEASURING INSTRUMENT

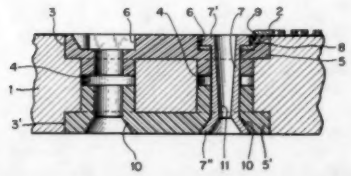
Wolfgang Reimar, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 5, 1981, Ser. No. 240,901

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009236

Int. Cl.³ H01R *13/415*

U.S. Cl. 339—126 R 3 Claims



1. In a position measuring instrument comprising a first component which includes a first electrically conducting sensor conductor and a second component which includes a second electrically conducting sensor conductor, wherein one of the two components is mounted to move relative to the other component, the improvement comprising:

means for defining first and second opposed oblong recesses in opposed surfaces of the first component;

means for defining at least one opening extending through the first component between the first and second oblong recesses;

first and second oblong insulating members shaped to fit within the first and second recesses, respectively, such that each insulating member is substantially prevented from rotating in the first component, each insulating member defining a hole passing therethrough such that the holes of the first and second insulating members are aligned, the hole of the first insulating member terminates in a prismatic recess, and the hole of the second insulating member terminates in a conical recess;

a contact member disposed in the holes of the insulating members, said contact member defining an enlarged head, sized to fit within the recess in the first insulating member to prevent the contact member from rotating with respect to the first insulating member, and a conically expanded end section which extends into the conical recess in the second insulating member, thereby simultaneously securing the first and second insulating members in the respective oblong recesses of the first component and substantially preventing the contact member from being pulled from the first component; and

means for electrically connecting the contact member and the first sensor conductor.

4,403,824

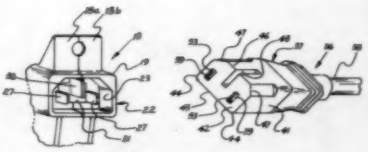
PLUG CONNECTOR AND RECEPTACLE

Ernest R. Scott, Mayfield Heights, Ohio, assignor to The Scott & Fetzer Company, Westlake, Ohio

Filed Mar. 2, 1981, Ser. No. 239,502

Int. Cl.³ H01R *13/64*

U.S. Cl. 339—186 R 3 Claims



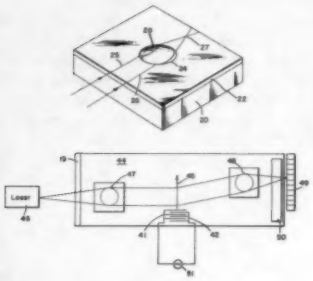
3. A detachable cord set for an electrical appliance having a receptacle with a geometrically coded cavity, the cord set including at one end a connector body for reception into the cavity, the connector body having a lead end face defining a perimetric profile complementary to the cavity with only one orientation acceptable thereto, a lead section of the connector body having a length at least generally equal to the depth of the cavity, the exterior of the lead section being defined by a generally prismatic projection of said lead end face profile, said lead end face profile including two mutually opposed straight long sides and two mutually opposed short sides, the corners joining one long side to the short sides being beveled, the corners joining the opposite long side to the two short sides being rounded, said end face being substantially the same as that of the standard European connector type CEE-22 but with the central grounding contact recess being replaced by a narrow rectangular keyway, said keyway extending through the mid-zone of the one long side, said end face being interrupted by a pair of recesses of relatively narrow rectangular form, the recesses being symmetrically spaced on opposite sides of the plane of said keyway and being in parallel alignment therewith, the keyway extending laterally inward from its associated long side into a plane common to said recesses, and an electrical contactor associated with each of said recesses within the body of the connector.

4,403,825

INTEGRATED OPTICS THIN FILM DEVICES AND FABRICATION THEREOF

Gregory L. Tangonan, Oxnard, and David L. Persechini, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 961,354, Nov. 16, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 206,797
Int. Cl.³ G02B 5/174
U.S. Cl. 350—96.11 19 Claims



1. An integrated optical device including:

(a) a substrate having a deformation in a surface thereof; and

(b) a thin film on said surface of said substrate, said thin film comprising a chalcogenide glass, the region of said film in proximity to said deformation having a predetermined varying index of refraction profile, the combination of said deformation and said varying index of refraction profile providing an aberration-free optical element in said thin film, said profile having been determined by successive exposure of portions of said region to controlled amounts of radiation to produce corresponding changes in the index of refraction of said glass within said region.

7. An integrated optic spectrum analyzer comprising:

(a) a substrate having a first and a second deformation on a surface thereof;

(b) a waveguiding layer on said surface of said substrate;

(c) means for introducing a beam of optical radiation into said waveguiding layer;

(d) means, in said waveguiding layer in the region of said first deformation, for collimating said beam;

(e) at least one surface acoustic wave-transducer on the surface of said waveguiding layer for generating an acoustic wave in said waveguiding layer transverse to said collimated beam to thereby interact with said beam;

(f) means for introducing RF signal to said at least one transducer;

(g) means, in said waveguiding layer in the region of said second deformation, for focusing said beam subsequent to its interaction with said acoustic wave;

(h) a detector; and

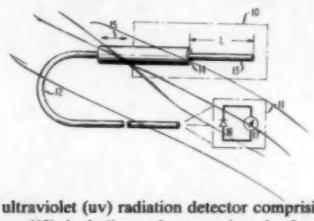
(i) means for introducing said focused beam to said detector, characterized in that (a) said waveguiding layer comprises a chalcogenide glass and (b) said collimating and said focusing means each comprise a region in said chalcogenide glass layer having a respective predetermined varying index of refraction profile, said profile having been predetermined by successively exposing portions of said region to controlled amounts of radiation to produce corresponding changes in the index of refraction of said glass, thereby forming an aberration-free geodesic lens.

4,403,826

ULTRAVIOLET RADIATION DETECTOR

Herman M. Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 23, 1981, Ser. No. 246,699
Int. Cl.³ G02B 5/14; G01J 1/42
U.S. Cl. 350—96.30 6 Claims



1. An ultraviolet (uv) radiation detector comprising:

a uv sensor (10), including at least one length of optical fiber having a core region made of a material which fluoresces at the uv wavelength of interest;

a visible light (v1) detector (11);

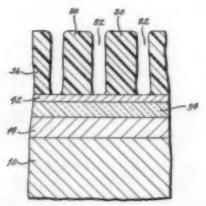
and a length of optical fiber (12) for coupling said uv sensor to said v1 detector.

4,403,827

PROCESS FOR PRODUCING A DIFFRACTION GRATING

David A. Bryan, St. Charles, and John K. Powers, St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sep. 12, 1980, Ser. No. 186,584
Int. Cl.³ G02B 5/18
U.S. Cl. 350—162.17 17 Claims



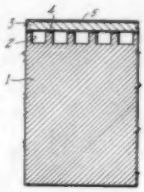
1. A process for forming a diffraction grating, said process comprising: applying an absorbing layer to a grating substance on which a grating pattern is to be produced, the absorbing layer being highly absorptive to radiation at a specific wavelength; applying a photoresist layer over the absorbing layer so that the absorbing layer is between the grating substance and the photoresist layer, the photoresist layer being photosensitive to radiation at the specific wavelength; directing beams of interfering coherent radiation of the specific wavelength onto the photoresist layer such that the photoresist layer is exposed in a series of closely spaced lines corresponding to the desired grating pattern; developing the exposed photoresist layer such that portions thereof are removed to provide alternate ridges and grooves in the photoresist layer which generally correspond to the desired grating pattern; and removing the absorbing material and some of the grating substance at the grooves so as to create corresponding grooves in the grating substance to thereby impart the grating pattern to the grating substance.

4,403,828

DAMAGE RESISTANT COATED LASER MIRROR

Jack W. Davis, East Hartford, and Paul R. Blaszuk, Lebanon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 1, 1981, Ser. No. 269,197
Int. Cl.³ G02B 5/08
U.S. Cl. 350—288 5 Claims



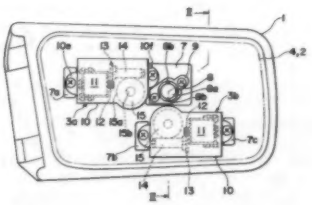
1. A damage resistant laser mirror comprising:
a copper substrate polished to an optical, laser radiation reflective finish; and
a thin film of molybdenum or tungsten coated on the copper substrate.

4,403,829

ANGLE ADJUSTING ARRANGEMENT FOR ADJUSTING AN ELEMENT ABOUT TWO AXES

Yoshio Thujinchi, Nagoya, and Yorinobu Sumi, Gifu, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed May 4, 1981, Ser. No. 261,137
Claims priority, application Japan, May 8, 1980, 55-63626[U]
Int. Cl.³ B60R 1/06
U.S. Cl. 350—289 6 Claims



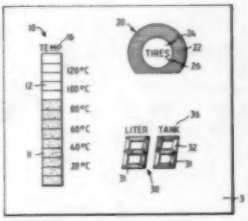
1. An apparatus for adjusting the angular position of an element about two axes, said apparatus comprising:
a case having a fixing base;
a back cover member supporting an element to be adjusted and including a rear face having approximately a central portion thereof pivotally connected to said fixing base at a pivot point;
a first driving unit positioned within said case on one side of a first axis extending through said pivot point for pivoting said back cover member and element about said first axis;
a second driving unit positioned within said case on one side of a second axis extending through said pivot point substantially at a right angle to said first axis for pivoting said back cover member and element about said second axis; and
said first and second driving units being of substantially identical construction, and each said driving unit comprising a housing fixed within said case and including first and second housing portions, a reversible motor within said housing, a push-pull control shaft extending from said housing and having an outer end connected to said rear face of said back cover member, and power transmitting means connecting said motor to said control shaft, such that selective reversible operation of said motor selectively advances and retracts said control shaft axially thereof with respect to said housing, thereby pivoting said back cover member and element in opposite directions about the respective said axis.

4,403,830

INDICATING DEVICE

Dieter Gerstner, Heilbronn, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Fed. Rep. of Germany

Filed Jul. 18, 1980, Ser. No. 170,992
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930507
Int. Cl.³ G02F 1/13
U.S. Cl. 350—331 R 4 Claims



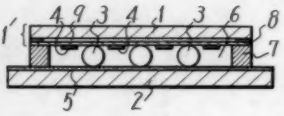
1. An indicating device comprising:
a first surface area having variable optical properties;
means for electronically varying an optical property of said first surface area between an inactive condition and an activated condition;
a second surface area having fixed optical properties including a first surface portion defining a bright area and a second surface portion defining a dark area, the dark area having an absorptivity of less than one hundred percent and the bright area having a reflectance of less than one hundred percent; and
means for transmitting light incident to said bright area and said dark area from a rear side of said second surface area;
said bright area having a first angle characteristic of light penetrating through the bright area from the rear side thereof, said first surface area having an active angle characteristic in its active condition equal to the first angle characteristic;
said dark area having a second angle characteristic of the light penetrating through the dark area from the rear side thereof, and said first surface area having an inactive angle characteristic in its inactive condition equal to said second angle characteristic;
said dark area having a first reflectance, the first surface area having a second reflectance in its inactive condition, and the first reflectance equaling the second reflectance; and
said dark area also having a first degree of transmission for a light incident from the rear side corresponding to said second reflectance, said bright area having a second degree of transmission for the light incident from the rear side, and said first surface area having a transmission in its active condition equal to said second degree of transmission.

4,403,831

DISPLAY APPARATUS

Yoshifumi Amano, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 301,114
Claims priority, application Japan, Sep. 19, 1980, 55-131039
Int. Cl.³ G02F 1/13
U.S. Cl. 350—334 3 Claims



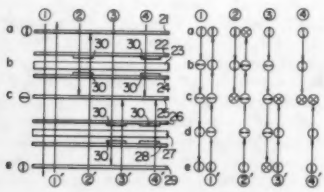
1. A display apparatus comprising:
(a) a first panel having an electrode provided on a surface thereof;
(b) a second panel having an electrode provided on a surface thereof;
(c) display material intervened between said electrodes of said first and second panels; and
(d) a spacer disposed between said first and second panels, peripheral portions of said first and second panels being sealed by sealing material characterized in that one of said first and second panels comprises a substrate and an elastic plate which is sealed to said substrate with its periphery, and fluid is sealed into a space defined by said substrate and elastic plate with such a pressure that said elastic plate contacts said spacer.

4,403,832

LIQUID CRYSTAL DISPLAY DEVICE

Masashi Tanaka, Koganei; Yutaka Nakajima, Mitaka; Takahiko Ibochi, Koganei, and Yoshimichi Shibuya, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1980, Ser. No. 199,978
Claims priority, application Japan, Oct. 24, 1979, 54-136406
Int. Cl.³ G02F 1/13
U.S. Cl. 350—335 8 Claims



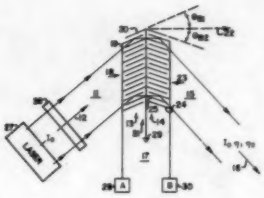
1. A liquid crystal display device comprising:
(a) a plurality of liquid crystal layers each for displaying a pattern, said liquid crystal layers being piled up;
(b) a pair of polarizers arranged above an uppermost liquid crystal layer and below a lowermost liquid crystal layer;
(c) electrode patterns provided for said liquid crystal layers and having predetermined shapes respectively; and
(d) at least one polarizer arranged between said liquid crystal layers in such a manner that a transmission axis of said polarizer is perpendicular to a transmission axis of each of two polarizers adjacent to said polarizer, so that said electrode patterns on different liquid crystal layers may be viewed in a darkened state at the same time without light areas being viewed where said electrode patterns overlap.

4,403,833

ELECTROOPTICAL MULTIPLIERS

Richard P. Kenan, Upper Arlington, and Carl M. Verber, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 18, 1981, Ser. No. 293,779
Int. Cl.³ G02F 1/03
U.S. Cl. 350—356 29 Claims



1. Apparatus for receiving light entering in a predetermined input direction therein and controlling the directions in which portions of the light travel through regions thereof so as to emerge therefrom in a selected output direction with intensity responsive to the product of a plurality of electrical potential differences multiplied together, comprising
an electrooptic waveguide,
first electrooptic reflective means, comprising a first electrode and a second electrode, on a first region in the waveguide, for forming a first Bragg grating in the first region positioned with a direction of Bragg incidence approximately in the predetermined input direction,
intermediate means for directing light reflected from the first Bragg grating in a predetermined intermediate direction into a second region in the waveguide,
second electrooptic reflective means, comprising a third electrode and a fourth electrode, on the second region in the waveguide, for forming a second Bragg grating in the second region positioned with a direction of Bragg incidence in approximately the predetermined intermediate direction,
light input means for directing light of known or controlled intensity to enter approximately in the predetermined input direction into the first electrooptic means,
first control means for applying a first electrical potential to the first electrode and a second electrical potential to the second electrode, to further direct a portion of the light entering into the first region by providing a first Bragg reflection thereof into the intermediate means, and
second control means for applying a third electrical potential to the third electrode and a fourth electrical potential to the fourth electrode, to further direct a portion of the light reflected into the second region by providing a second Bragg reflection thereof beyond the second region in the selected output direction.

4,403,834

ACOUSTIC-WAVE DEVICE

Victor B. Kley, Berkeley, Calif., assignor to Kley & Associates, Berkeley, Calif.

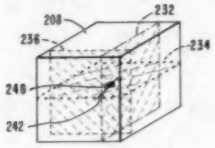
Continuation-in-part of Ser. No. 60,027, Jul. 23, 1979, abandoned. This application May 23, 1980, Ser. No. 152,630
Int. Cl.³ G02F 1/03, 1/11, 1/135
U.S. Cl. 350—371 2 Claims

1. An acoustic-wave device comprising:
a light modifying member having three dimensions, said member including layers of electret material and an electrooptic material associated with each layer of the electret material, said member being responsive to a combination of three mutually crossing acoustic waves and a non-acoustic energy condition, said energy condition being

applied momentarily at preselected times when said acoustic waves are at preselected intersection points in the member, such that a changed, electrically polarized condition is produced at said intersection points in the electrooptic material,

means applying the acoustic waves to the member in three, mutually perpendicular directions,

means momentarily applying the non-acoustic energy condition to the member at said preselected times,



wherein the changed, electrically polarized condition includes a spatial change in light impinging on said member producing a three-dimensional image and wherein said spatial change is not affected by subsequent applications of said non-acoustic energy condition, and

wherein the changed, electrically polarized condition produced at each preselected point during the momentarily applied non-acoustic energy condition is a change in birefringence.

4,403,835

OBJECTIVE LENS FOR MICROSCOPE

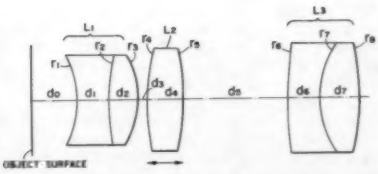
Kazuo Ushida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 27, 1981, Ser. No. 248,352

Claims priority, application Japan, Apr. 5, 1980, 55-44808

Int. Cl.³ G02B *21/02*

U.S. Cl. 350—414 **12 Claims**



10. An objective lens for microscope for observing an object through a parallel planar member disposed between said objective lens and said object to be observed, comprising in succession from the object side:

a first lens group;

a second lens group having a positive refractive power; and

a third lens group having a positive refractive power;

said second lens group being movable in the direction of the optical axis and relative to said first and third lens group so as to compensate aberrations varied by the parallel planar member.

4,403,836

CATA-DIOPTRIC TYPE TELEPHOTO LENS SYSTEM

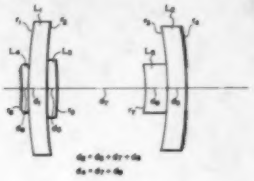
Shin'ichi Mihara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,902

Claims priority, application Japan, Apr. 4, 1980, 55/43599

Int. Cl.³ G02B *17/08*

U.S. Cl. 350—444 **6 Claims**



1. A cata-dioptric type telephoto lens system comprising a first, second, third, fourth and fifth lens system in the order according to the advancing direction of rays, said first lens being a positive meniscus lens arranged convex toward the object side, said second lens being a negative meniscus lens arranged convex toward the image side and having a reflecting surface formed on the convex surface thereof by leaving a transparent central portion, said third lens being a biconvex lens cemented to the surface on the image side of said first lens, said fourth lens being a biconcave lens cemented to the surface on the object side of said first lens and having a reflecting surface formed on the surface on the object side thereof, said fifth lens being a negative meniscus lens cemented to the surface on the object side of said second lens, said cata-dioptric type telephoto lens system satisfying the following conditions:

$$0.45f<r_1<0.75f \quad (1)$$

$$0.29f<f_{12}<0.33f \quad (2)$$

$$0.03f<d_8+d_3<0.05f \quad (3)$$

$$n_3>1.73 \quad (4)$$

$$n_4<1.58 \quad (5)$$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_{12} represents the total focal length of the first and second lenses, reference symbol r_1 represents the radius of curvature of the surface on the object side of the first lens, reference symbols d_3 and d_8 respectively represent thicknesses of the second and fifth lenses, and reference symbols n_3 and n_4 respectively represent refractive indices of the third and fourth lenses.

4,403,837

OBJECTIVE FOR ENDOSCOPES

Ken-ichi Nakahashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,410

Claims priority, application Japan, Oct. 8, 1980, 55-139904

Int. Cl.³ G02B *5/16, 9/60*

U.S. Cl. 350—465 **14 Claims**

1. An objective for endoscopes comprising a first negative meniscus lens component having a convex surface on the object side, a second positive meniscus lens component having a concave surface on the object side, a third positive lens component, a fourth lens component consisting of a positive lens element and a negative lens element cemented to said positive lens element and a fifth positive lens component, said objective for endoscopes satisfying the following conditions:

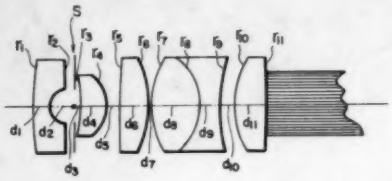
(1) $r_3 \leqq -3f$

(2) $-1.5 \leqq r_6/r_7 \leqq -0.5$

(3) $-4.0f \leqq r_6 \leqq -1.0f$

(4) $-3.0f<r_4<-0.8f$
(5) $1.0f<|r_8|<2.5f$
(6) $|n_4-n_5|>0.1$

wherein reference symbols r_3, r_4, r_6, r_7 and r_8 represent radii of curvature respectively of both surfaces of the second lens



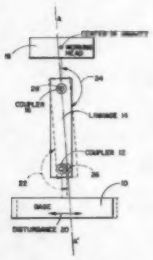
component, the surface on the image side of the third lens component and the surface on the object side and the cemented surface of the fourth lens component, reference symbols n_4 and n_5 represent respective refractive indices of both lens element of the fourth lens component, and reference symbol f represents a focal length of the entire system.

4,403,838

PRECISION POINTING AND STABILIZATION SYSTEM

Milton M. Beilock, Orange, and John M. Wuerth, Fullerton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 30, 1980, Ser. No. 202,209
Int. Cl.³ G02B *23/16*
U.S. Cl. 350—500 **18 Claims**



1. Apparatus for controlling the spatial orientation of an angularly displacable working head supported by a base and relative to a given frame of reference, said apparatus comprising:

a linkage having terminal first and second articulate couplers coupling said working head to said base across the longitudinal axis of said linkage;

said first and second articulate couplers located relative to each other to effectively isolate said working head freely of components of acceleration of said base perpendicular to said linkage longitudinal axis;

means for sensing and providing control signals derived from said sensing, the relative angular positions and relative angular velocities between said working head and said linkage, and the existing spatial orientation of said working head relative to said given frame of reference;

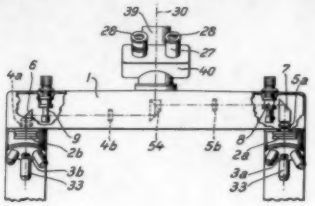
means for applying torque between said working head and said linkage and between said linkage and said base responsive to said derived control signals to control the spatial orientation of said working head relative to said given frame of reference.

4,403,839

COMPARATOR MACROSCOPE OR MICROSCOPE

Artur Reichel, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,240
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006657
Int. Cl.³ G02B *21/20, 21/36*
U.S. Cl. 350—514 **6 Claims**



1. A comparator viewing device for simultaneously viewing objects to be compared, either macroscopically or microscopically, comprising:

a comparator bridge member arranged therein at each end thereof one of two similar optical systems, each of said optical systems including first and second optical elements and a refracting prism located between said first and second optical elements, each of said optical system providing a partial beam path and wherein the partial beam paths of said optical systems are brought together by means of said refracting prisms in said optical systems, said comparator bridge further comprising a first beam splitter prism provided between the second elements of said two optical systems for uniting the two partial beam paths in congruently superposed fashion on its splitter surface to provide a combined beam path;

a pair of individual optical viewing members attached to the two ends of said bridge member, each of said viewing members comprising at least one objective lens;

a binocular tube mounted on said bridge member in the combined beam path of said first beam splitter prism, said binocular tube carrying two occular lenses simultaneously lying in said combined beam path and being mounted on occular supports; and

a marking device comprising a light-emitting surface for producing a luminous spot on the objects to be viewed, said marking device being located in the combined beam path on the side of said first beam splitter opposite the objects to be viewed, whereby the same beam path serves for viewing of the objects and also for producing the luminous spot on the objects to be viewed, and the luminous spot is always produced on the location of the object which appears in the center of the field of vision, wherein said marking device is mounted on one of said occular supports and comprises a mounting member adapted for detachable mounting on said occular support and an upper member for supporting said light-emitting surface, said upper member being pivotably attached to said mounting member so that the marking device is selectively movable into and out of the beam path of the respective occular lens.

4,403,840

VARIABLE FOCUS EYEGLASSES

Milton R. Okun, P.O. Box 377, Canton, Mass. 02021

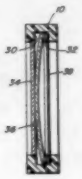
Filed Mar. 9, 1981, Ser. No. 241,781
Int. Cl.³ G02C *1/00*
U.S. Cl. 351—41 **19 Claims**

1. Apparatus for variable focus eyeglasses comprising:

(a) right and left frame means for holding a plurality of

optical components comprising forward and rear frame edges defining a single continuous interior track of generally circular shape; and

(b) a plurality of rigid and flexible optical components adapted to fit securely within the single interior track of



each frame means such that at least one of said flexible or rigid optical components is movable along an anterior-posterior axis within said track resulting in the distortion and restitution of a flexible component by one or more of the rigid components so as to vary the focal length of the eyeglasses.

4,403,841

APPARATUS FOR EXAMINING ANTERIOR PORTIONS OF THE EYE

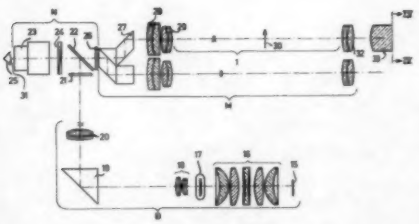
Walter H. Lang, and Franz Muchel, both of Konigsbronn, Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,076

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1979, 2946451

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—215 **2 Claims**



1. An ophthalmological instrument for examination of anterior regions of an eye, comprising a binocular microscope, and a base establishing a vertical axis of rotary support for said microscope, said microscope including an objective offset from said rotary axis, and the microscope axis through said objective being aligned for intersection with said rotary axis, said microscope including a beam-splitter serving the respective binocular paths thereof from said microscope axis and said microscope also including in each of its binocular paths a first objective producing an intermediate image and a second objective focusing said intermediate image at infinity, a source of polarized illumination and optical elements directing its polarized light onto the microscope axis and in the direction of said objective at a location between said objective and said beam-splitter, a Nomarski prism interposed between said objective and the location of source-light introduction to the microscope axis, and an interference-contrast resolver interposed between said location and said beam-splitter.

4,403,842

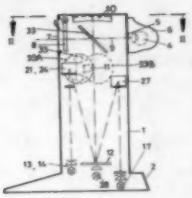
APPARATUS FOR TESTING TWILIGHT VISION AND BLINDING SENSITIVITY

Elfriede Aulhorn, Tuebingen; Jakob Kocher, Dusslingen, and Josef Reiner, Rodenkirchen, all of Fed. Rep. of Germany, assignors to Oculus Optikgeraete GmbH, Dutenhofen, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,242

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—237 **6 Claims**



1. In an apparatus for testing twilight vision and blinding sensitivity, including a screen which is illuminated simultaneously by first and second projectors, a test figure being arranged in the beam of the first projector and including means for controlling the light intensity from both projectors with respect to one another so that the light intensity from the first projector increases in the same degree as the light intensity from the second projector is decreased and vice versa, and including a headlight source arranged next to the field of vision on the screen, the improvement comprising wherein the screen is arranged at the focal point of a concave mirror, wherein between the concave mirror and the screen there is arranged a semi-transparent mirror which is inclined with respect to the optical axis of the concave mirror, which semi-transparent mirror is opposite the eyes of the tested person, wherein the apparatus has an opening along the line of sight of the tested person which permits an unhindered looking out, and wherein the opening is provided with a filter for reducing the light entering from outside.

4,403,843

SWITCHING ASSEMBLY FOR FOCUSSING, PHOTOSENSITIVE ELEMENTS OF A CAMERA

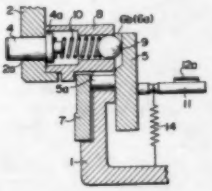
Yoshihisa Maitani, and Mitsuo Kawazoe, both of Hachioji, Japan, assignors to Olympus Optical Company Ltd., Japan

Filed Mar. 22, 1982, Ser. No. 360,553

Claims priority, application Japan, Jun. 10, 1981, 56-90155

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—25 **6 Claims**



1. In a camera having an interchangeable lens mount which is capable of receiving lenses having different brightness levels, said combination comprising:

a brightness switch which is manually moveable between first and second brightness positions and will remain in the position in which it is placed when a lens is mounted on said lens mount and which is automatically biased into said

first brightness position whenever there is no lens mounted on said lens mount; and

an in-focus detector circuit for detecting an in-focus condition as a function of the amount of light which passes through a lens mounted on said lens mount, said in-focus detector operating in a first manner which presumes that a lens having a first brightness level is mounted on said lens mount when said brightness switch is in said first position and operating in a second manner which presumes that a lens having a second brightness level is mounted on said lens mount when said brightness switch is in said second brightness position.

4,403,844

MALFUNCTION PREVENTING DEVICE FOR CAMERA

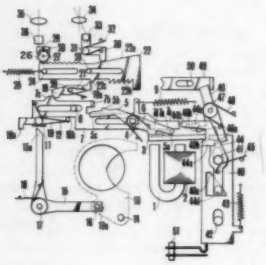
Akihiro Namai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1982, Ser. No. 376,206

Claims priority, application Japan, May 18, 1981, 56-75477; May 18, 1981, 56-75478

Int. Cl.³ G03B *3/00, 9/08*

U.S. Cl. 354—234 **14 Claims**



1. A malfunction preventing device for a camera comprising:

(a) an electromagnet;

(b) control means for controlling the operation of said camera;

(c) latching means for engagement with said control means, said latching means when actuated by said electromagnet releasing said engagement to permit said control means to move; and

(d) prohibiting means for prohibiting said latching means from operating before actuation of a camera release, said prohibiting means being responsive to actuation of the camera release for rendering said latching means operative and, after an initiation of an operation of said control means, having its position maintained by said control means.

4,403,845

CASSETTE FOR HOLDING AND DISPENSING A ROLL OF WEB MATERIAL

Edward Buelens, Kontich, and Carolus C. Goossens, Berchem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

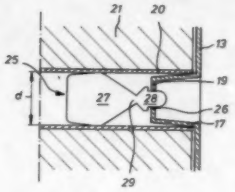
Filed Dec. 8, 1981, Ser. No. 328,626

Claims priority, application United Kingdom, Dec. 9, 1980, 8039456

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—275 **10 Claims**

1. A cassette for holding and dispensing a roll of web material wound onto a tubular core, said cassette comprising a container having a tubular shell and two end walls with central hub portions, a tubular core carrying a roll of web material wound thereon and rotatably supported by said hub portions, the shell having a peripheral exit slot through which the material can be drawn from said roll, and a generally rigid locking member for preventing rotation of the core prior to the first use of the cassette, such member including two end portions connected by a weakened intermediate portion which can be ruptured by rotation of the core incidental to initial withdrawal of the web material from the cassette, one of said end portions of said locking member extending into the interior of said core in frictional engagement with the inner surface thereof, and the other end portion being in non-rotative engagement with one of said hub portions to thereby prevent rotation of the core until said weakened portion is ruptured.



4,403,846

ARRANGEMENT FOR INTRODUCING PHOTOSENSITIVE STRIPS INTO AND TRANSPORTING THE SAME THROUGH A DEVELOPING MACHINE

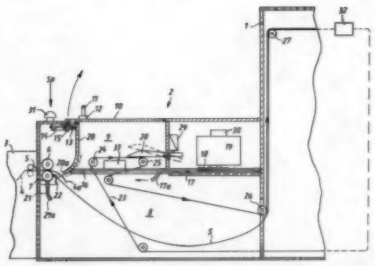
Viktor Osegowitsch, Taufkirchen; Werner Sperber, and Wolfgang Viehrig, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,771

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034084

Int. Cl.³ G03D *13/06*

U.S. Cl. 354—310 **8 Claims**



1. An arrangement for introducing strips of photosensitive material, particularly such accommodated in cassettes, in a light-sealed manner into and for transporting such strips through the interior of a treating, especially developing, machine having at least one slot for the passage of the respective strip therethrough into a given region of the interior, comprising means for bounding an attaching compartment adjacent to the given region of the interior; means for light-impermeably separating said attaching compartment from the exterior of the machine, including a lid; means for transferring the leading end of the respective strip upon its passage through the slot into said attaching compartment, including a pivotable transferring member bounding a light-sealed path for the leading end between the slot and said attaching compartment at least upon the conclusion of the transferring operation; means for transporting the respective strip through said attaching compart-

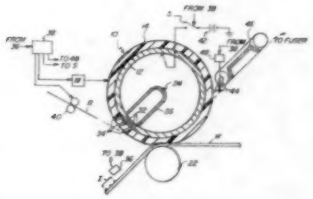
ment and through the interior of the machine, including an endless band situated next to the respective strip and having a section passing through said attaching compartment, and means for attaching the leading end of the respective strip to said section; means for light-impermeably separating said attaching compartment from the interior of the machine while said lid is open, including a separating member mounted between said attaching compartment and the interior of the machine for movement between an open and a closed position and establishing a light-impermeable contact with said transferring member in said closed position; means for causing said separating member to move between said positions thereof, including drive means; means for latching said lid in its closing position; and means for releasing said latching means when said separating member is in the closed position thereof, including control means connected to said drive means and operative for detecting the closed position of said separating member and for generating a control signal indicative thereof; and means for displacing said latching means into its releasing position in response to said control signal.

4,403,847

ELECTROGRAPHIC TRANSFER APPARATUS

Gene L. Chrestensen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,735
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 TR **6 Claims**



1. Apparatus for electrostatically transferring a transferable image from an image-carrying member to a receiver member supported on and urged by said apparatus into pressure contact with such member, said apparatus comprising:

resilient, deformable, electrically conductive means, adapted to be coupled to a source of electrical image transferring potential, said conductive means having a passage connectible to a vacuum source for vacuum tacking a receiver member to a surface of said conductive means, such passage having a longitudinal axis which, at said surface defines an oblique angle to said surface whereby said passage is closed by deformation of said means during pressure contact with the image-carrying member so that an electrical transfer potential is uniformly applied to the receiver member.

4,403,848

ELECTRONIC COLOR PRINTING SYSTEM

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 17, 1982, Ser. No. 349,216
Int. Cl.³ G03G *15/00, 15/01*
U.S. Cl. 355—4 **19 Claims**

1. A system for producing color copies comprising:

(a) a movable photoreceptor;

(b) means to uniformly charge said photoreceptor in preparation for imaging;

(c) a beam of high intensity radiation impinging on said photoreceptor at a point downstream of said charge means;

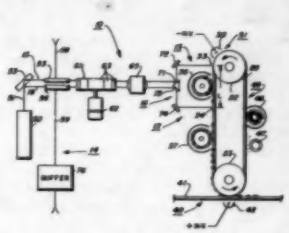
(d) means for scanning said beam across said photoreceptor;

(e) modulating means to modulate said beam in accordance with color image signals as said beam is scanned across said photoreceptor whereby to selectively reduce the charge on said photoreceptor and create a first color latent electrostatic image on said photoreceptor;

(f) first color developing means for developing said first color image;

(g) at least one additional beam of high intensity radiation impinging on said photoreceptor at a point downstream of said color developing means;

(h) means for scanning said additional beam across said photoreceptor;



(i) second modulating means to modulate said additional beam in accordance with color image signals as said additional beam is scanned across said photoreceptor whereby to selectively reduce the charge on said photoreceptor and create a second color latent electrostatic image on said photoreceptor;

(i) second color developing means for developing said second color image; and

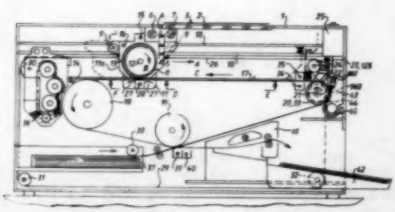
(k) means for transferring said combined first and second color images to a copy substrate material to produce color copies.

4,403,849

ELECTROSTATIC COPYING DEVICE

Erich Burger, Unterhaching; Horst Bickl, and Hans-Peter Huber, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,353
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048728
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 **23 Claims**



1. An electrostatic copying device comprising support means, a planar transparent support plate mounted on said support means for receiving a stationary original of a predetermined size to be copied; a slide movable on a predetermined planar path beneath the transparent support plate; a recording cylinder having a photosensitive peripheral surface turnably mounted on said slide; raster objective means carried by said slide for producing an image of the original on said photosensitive surface of said cylinder; corona discharge means on said

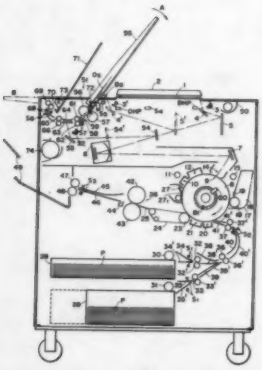
slide for uniformly charging said photosensitive surface before illuminating the same by said raster objective means; first drive means for moving said slide with a predetermined speed along said predetermined path from a starting to an end position and for rotating said cylinder with a peripheral speed corresponding to the speed of the image produced by said raster objective means on said photosensitive surface of said cylinder; a band-shaped dielectric recording carrier extending beneath said recording cylinder in the direction of said predetermined path and having at least over said predetermined length of the original a planar portion; means on said slide for transmitting the charge image from said recording cylinder to said planar portion of said band-shaped recording carrier during movement of said slide in one direction along said predetermined path from said starting to said end position; a plurality of treating stations arranged along said band-shaped recording carrier following said planar portion thereof for transmitting the image from said band-shaped recording carrier to a paper within a predetermined time period; and second drive means for moving, after transmission of the image from said recording cylinder to said band-shaped carrier, said recording cylinder in a direction opposite to said one direction back from said end position to said starting position and for simultaneously moving said band-shaped carrier in the same direction as said recording cylinder and both at the same speed corresponding to a speed according to said predetermined time period.

4,403,850

COPYING DEVICE HAVING PLURAL EXPOSURE MODES

Shunichi Masuda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 284,139
Claims priority, application Japan, Jul. 25, 1980, 55-102581
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **13 Claims**



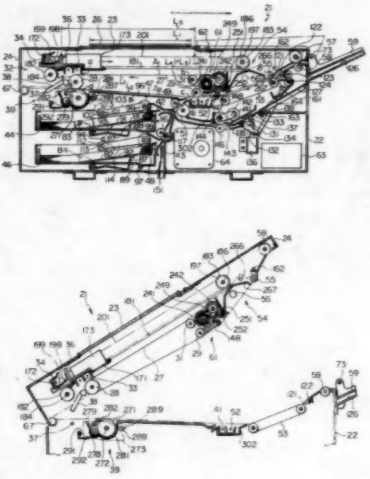
1. A copying device comprising:
a first scanning means for exposing an original while it is being fed;
a second scanning means comprising a reciprocally moving member for exposing the original;
process means for performing a copying operation based on the exposed original image;
a guide member for being set to feed the original so that a copying operation by said first scanning means is performed; and
control means responsive to said setting of said guide member, during a copying operation by said second scanning means, for suspending the copying operation being carried out so as to enable the copying operation by said first scanning means to be carried out, and to enable the copying operation by said second scanning means to be resumed after the completion of the copying operation by said first scanning means.

4,403,851

ELECTROSTATIC COPYING MACHINE COMPRISING IMPROVED ARRANGEMENT OF OPERATING UNITS

Nobuyuki Yanagawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 123,637, Feb. 22, 1980. This application Aug. 17, 1981, Ser. No. 293,539
Claims priority, application Japan, Mar. 9, 1979, 54-28009
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **24 Claims**



2. An electrostatic copying machine comprising:
a housing;
a cover provided on top of the housing and being movable between open and closed positions;
first and second parallel rollers rotatably supported by the cover;
an endless photoconductive belt trained around the first and second rollers;
imaging means provided in the cover for forming an electrostatic image of an original document on a portion of the belt between the first and second rollers;
developing means provided in the housing for developing the electrostatic image to produce a toner image, the developing means being adjacent to the first roller when the cover is in the closed position;
transfer means provided in the housing for transferring the toner image to a copy sheet, the transfer means being adjacent to the second roller when the cover is in the closed position;
drive means for rotating the first and second rollers and thereby the belt in a direction such that the portion of the belt on which the electrostatic image is formed moves around the first roller and then around the second roller; and
control means for controlling the imaging means, drive means and transfer means in such a manner that, for multiple copying operation, the belt is alternatingly stopped while the imaging means forms an electrostatic image thereon and driven for one half revolution;
the control means further controlling the imaging means,

drive means and transfer means in such a manner that, for single copying operation, the belt is stopped while the imaging means forms an electrostatic image thereon and then driven for one revolution.

4,403,852

DEVELOPER RECOVERING DEVICE FOR ELECTROSTATIC IMAGE REPRODUCING SYSTEM

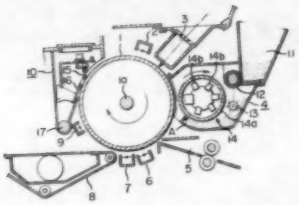
Tsugio Hirabayashi, and Junichi Koiso, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,510

Claims priority, application Japan, Dec. 20, 1980, 55-179693

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—15 **10 Claims**



1. In an electrostatic image reproducing system including a developing unit (4), a rotatable photosensitive drum (1) arranged to receive developer containing a magnetic ingredient from said developing unit, a cleaning unit (10) arranged to clean said developer off of said photosensitive drum, and a developer recovering device for recycling said developer from said cleaning unit to said developing unit,

the improvement wherein said developer recovering device comprises:

developer conveying means including a revolving element (19) made of a non-magnetic material and having an outer surface, and a plurality of magnets (18) arranged adjacent the inner surface of the circumference of said revolving element, and

a casing (21) encircling at least a portion of the outer surface of said revolving element (19) with a given spacing therebetween for receiving developer containing said magnetic ingredient;

said revolving element being arranged to pick up said developer from said casing by the magnetic power of said magnets,

said picked up developer being conveyed to said developing unit by said revolving element as ears of developer on said revolving element.

4,403,853

SLIT EXPOSURE DEVICE

Petrus J. P. Hovens, Tegelen, and Adrianus H. Willemse, Grubbenvorst, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

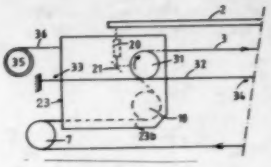
Filed Jul. 13, 1981, Ser. No. 282,423

Claims priority, application Netherlands, Jul. 24, 1980, 8004250

Int. Cl.³ G03G *15/04, 15/28*

U.S. Cl. 355—16 **4 Claims**

1. A slit exposure device for projecting an image of an original onto a moving photosensitive belt, comprising a stationary object plane, means for illuminating the original, an optical system movable back and forth in a path parallel to said object plane, at least two interconnected belt deflecting rollers and drive means for moving said rollers along and parallel to the object plane with the optical system, at least one of said rollers deflecting the photosensitive belt counterclockwise from its original direction of movement and at least one of said rollers deflecting the belt in clockwise direction, said optical system being arranged to project the image of an original in linear



portions onto the photosensitive belt at a location within the path formed by the portions of the belt on and between said deflecting rollers.

4,403,854

METHOD AND APPARATUS FOR MAKING COLOR PRINTS IN AUTOMATIC DEPENDENCE UPON THE FILM TYPE INVOLVED

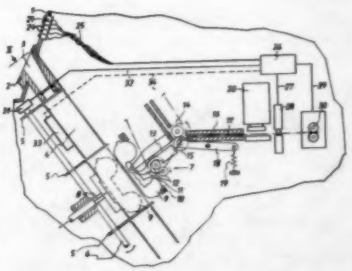
Werner von Stein, Hamburg, and Berthold Fergg, Taufkirchen, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,757

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749721

Int. Cl.³ G03B *27/78*

U.S. Cl. 355—41 **3 Claims**

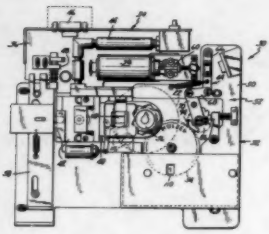


1. In a color print machine including an automatic exposure control system and an encoding station of the type comprising a memory storing control signal for adjusting the automatic exposure control system for predetermined differing color film types, and wherein the incoming color films are stored in cassettes provided with film type identification data so that it is not necessary to provide the data on each individual image field, in combination, an input unit for feeding in the memory input signals indicative of the type of a film in process identified by the data on the cassettes; means for addressing the memory to read out the stored control signals; means for activating the encoding station to provide on the film to be printed film-type identifying code markings; scanning means operative for sensing said markings and generating corresponding exposure adjusting signals; and means for applying the adjusting signals to the exposure control system for the particular color film involved.

4,403,855
DISC FILM FRAME POSITION INDICATOR

Richard D. Anderson, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Feb. 18, 1982, Ser. No. 349,927
Int. Cl.³ G03B 27/32, 27/52
U.S. Cl. 355—64 8 Claims



1. An apparatus in combination with a photographic printer having a print gate aperture, the apparatus indicating which of a plurality of film frames of a disc-like film unit is positioned at the print gate aperture, the apparatus comprising:

a base positioned on the photographic printer;

means for holding the disc-like film unit for rotational indexing of the selected film frame to the print gate aperture including a first gear, the means for holding a disc-like film unit being rotatably attached to the base;

means for actuating the rotational indexing of selected film frames to the print gate aperture including a second gear, the means for actuating positioned on the base;

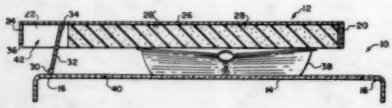
indicia display means having a third gear for displaying indicia to indicate which of the film frames in a disc-like film unit is at the print gate aperture, the third gear being rotatably positioned on the base between the first and second gear and cooperating with the first and second gear such that the disc-like film unit is rotationally indexed; and

cover means having a viewing portion for permitting viewing only the indicium that indicates the film frame positioned at the print gate aperture.

4,403,856
OFFICE COPIER WITH ARTICULATED HINGE COVER

Nicholas L. Torio, Burlington, and Samuel R. Di Nallo, Sr., Framingham, both of Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 126,535, Mar. 3, 1980, Pat. No. 4,386,847. This application Sep. 1, 1977, Ser. No. 413,977
Int. Cl.³ G03B 27/62
U.S. Cl. 355—75 12 Claims



1. In an electrostatic document copier chassis having a framing structure and an upwardly facing rectangular platen framed by said structure, said platen adapted to receive thereon an article such as a document or the like with a surface of said article facing downwardly against the platen in order to enable illumination of said surface from the interior of the chassis for imaging purposes, a cover member having an articulated connection with said framing structure and adapted for covering the article when the latter is in imaging position and accommodating to different thicknesses of respective articles being imaged, said cover member and articulated connection comprising:

A. a rigid inverted tray-like member having peripheral walls defining a downwardly opening chamber and of a size and configuration normally to overlie the platen,

B. a hinge link concealed within the traylike member and coupling said member to said framing structure for articulated swinging movement relative to said platen,

i. said hinge link having a first pivotal connection with said tray-like member on its interior defining a first axis parallel with an end peripheral wall thereof,

ii. and having a second pivotal connection with the framing structure at an end of said platen defining a second axis parallel with and spaced from said first axis,

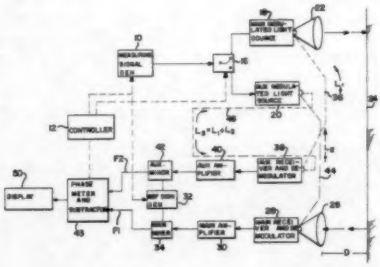
iii. said first pivotal connection being the higher and innermost one of said pivotal connections, the second pivotal connection being the lower and outermost of said pivotal connections, said first pivotal connection being in a plane spaced horizontally above the horizontal plane of the second pivotal connection, said pivotal connections being independently connected to said framing structure and inside of said cover member parallel said end peripheral wall,

C. the resulting articulated connection enabling accommodation of articles of different thickness on the platen covered by said tray-like member while said latter member remains substantially parallel with said platen with minimization of lateral translational movement of said cover relative to said platen.

4,403,857
DISTANCE MEASURING DEVICE AND METHOD

Hobbe D. Holscher, Randburg, South Africa, assignor to South African Inventions Development Corporation, Pretoria, South Africa

Filed Oct. 23, 1980, Ser. No. 199,880
Claims priority, application South Africa, Oct. 23, 1979, 79/5655
Int. Cl.³ G01C 3/08
U.S. Cl. 356—5 15 Claims



1. An apparatus for determining the distance between a first position at which the apparatus is located and a second position, which includes

a generating means for generating a measuring signal;

a first and a second transmitting means for transmitting the measuring signal;

a switching means for connecting the generating means between the first and the second transmitting means;

a first detecting means and a second detecting means responsive to signals transmitted by the first and second transmitting means;

a first path defining means defining a first path of fixed length between the first transmitting means and the second detecting means for conveying signals transmitted by the first transmitting means to the second detecting means;

a second path defining means defining a second path of fixed length between the second transmitting means and the first detecting means for conveying signals transmitted by the second transmitting means to the first detecting means;

a third path defining means defining a third path of fixed length between the second transmitting means and the second detecting means for conveying signals transmitted by the second transmitting means to the second detecting means;

with the first detecting means also being responsive to signals transmitted by the first transmitting means to the second position and returned to the first position; and

a phase difference determining means for determining the difference in phase angle between the output signals of the first and second detecting means, the phase difference determining means being adapted to determine the distance by determining the difference between the phase angle determined when the first transmitting means is connected to the generating means and that determined when the second transmitting means is connected to the generating means.

4,403,858

DEFECT INSPECTION SYSTEM

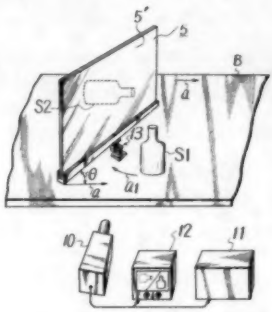
Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,229

Claims priority, application Japan, Feb. 21, 1980, 55-20965

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—237 **6 Claims**



1. A defect inspection system comprising:

(a) an image sensing means for picking up an object to be inspected;

(b) means for providing an image of said object; said image providing means being so located that the image of said object provided thereby is not in parallel to said object, said image sensing means being so located that both of said object and said image thereof are picked up thereby; and

(c) means for receiving an output from said image sensing means and inspecting whether or not said object contains flaws.

4,403,859

PHOTOELECTRIC INCREMENTAL MEASURING APPARATUS

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Dec. 11, 1980, Ser. No. 215,410

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952106

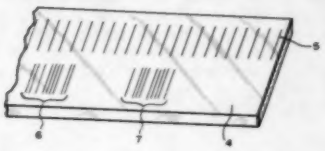
Int. Cl.³ G01D *5/245*

U.S. Cl. 356—374 **19 Claims**

1. In a photoelectric incremental measuring apparatus for measuring the relative displacement of two objects, the apparatus including a measuring scale and a scanning unit for scanning the scale having a reticle, the scale and reticle each carrying a measuring grid, the improvement comprising:

the scale having at least two nonidentical reference marks, each of which reference marks comprises a line group with an irregular line spacing pattern;

the reticle having at least two reading fields, each of which reading fields comprises a line group with an irregular line spacing pattern that is substantially identical to the line spacing pattern of a selected one of the reference marks, the reading fields positioned on the reticle such that each



reading field aligns simultaneously with its corresponding reference mark at only one relative position between the scale and the scanning unit as the scanning unit moves relative to the scale;

the scanning unit having at least two reference mark reading positions, each reference mark reading position comprising a respective detection means for detecting the alignment of the respective reading field with its corresponding reference mark and for generating respective individual detection signals in response thereto; and

means for combining the individual detection signals to generate a composite detection signal of higher accuracy than the individual detection signals.

4,403,860

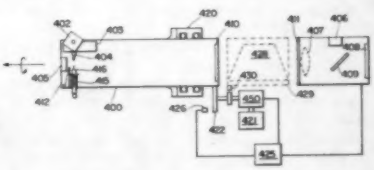
APPARATUS FOR DETERMINING DIMENSIONS

Timothy R. Pryor, Windsor, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Mar. 27, 1980, Ser. No. 134,465

Int. Cl.³ B27G *23/00*; G01B *11/12, 11/14*

U.S. Cl. 356—375 **22 Claims**



1. Apparatus for working an object with a tool comprising:

means for supporting an object in a working position to be worked on by a tool;

a tool for working on the object;

means for monitoring a dimension of said object being worked on during normal operating of the apparatus comprising a member adapted to contact a surface being worked, said member comprising an edge located remote from the point at which said member contacts a surface being worked;

means for monitoring a dimension or position of said tool during normal operation of the apparatus comprising an edge provided on said tool at a point remote from the point at which said tool contacts a worked-upon surface;

said object monitoring means and said tool monitoring means comprising means for directing electromagnetic radiation onto said edges, electromagnetic radiation detec-

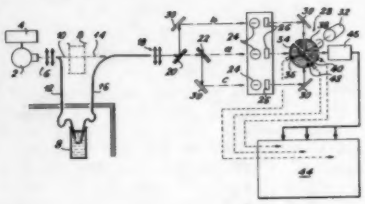
tor means comprising a plurality of discrete electromagnetic radiation sensitive elements disposed in an array, each element being capable of producing an output signal in response to incident electromagnetic radiation, lens means for focussing images of said edges on said light detectors, and means for analyzing the output signals from said radiation sensitive elements to monitor a dimension of a surface being worked upon and to monitor a dimension or position of said tool.

4,403,861

PHOTOMETRIC ANALYZER FOR AUTOMATICALLY STUDYING COMPLEX SOLUTIONS

Gilbert Boisde, Bures sur Yvette; Claude Bonnejean, Ris Orangis, and Jean J. Perez, Chatillon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 29, 1980, Ser. No. 220,971
Claims priority, application France, Jan. 23, 1980, 8001408
Int. Cl.³ G01J 3/50
U.S. Cl. 356—407 **9 Claims**



1. A photometric measuring device for automatically studying complex solutions with a variable background noise, wherein it comprises:

a regulated light source providing a light beam for illuminating by means of an optical system a measuring cell adapted to contain a solution to be studied;

means for splitting the light beam after it is affected by said solution into n individual light beams in which n is an integer higher than 2;

balancing means for balancing the light intensity of each of said n light beams;

means for making said n light beams monochromatic so as to associate with each of said n light beams a predetermined wavelength;

a discriminator for distinguishing said n wavelengths from one another;

a single detector able to transform the light beam from said discriminator into an electrical signal;

an analog computing system responsive to said electrical signal for calculating the concentration of the most n−1 chemical species present in the solution; and

means for the visual display of the results.

4,403,862

VISIBILITY MEASURING APPARATUS USING LIGHT CONDUCTORS

Folke Lofgren, and Sven-Erik Soderstrom, both of Västerås, Sweden, assignors to Asea Aktiebolag, Västeras, Sweden

Filed Nov. 13, 1978, Ser. No. 960,438
Claims priority, application Sweden, Nov. 18, 1977, 7713022
Int. Cl.³ G01N 21/00
U.S. Cl. 356—437 **4 Claims**

1. Apparatus for measuring atmospheric visibility, comprising:

a plurality of light transmitters located at spaced apart points along a given path;

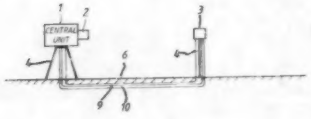
a corresponding plurality of light receivers, positioned within an area in which the atmospheric visibility is to be measured and each said light receiver being located in spaced relationship to a respective one of said plurality of light transmitters to form a plurality of measuring bases along said path;

control means for generating light pulses and receiving light pulses transmitted through each of said measuring bases independently of light transmitted through any other measuring base;

a plurality of first light conductors for transmitting said light pulses from said control means to respective ones of said plurality of light transmitters;

a plurality of second light conductors for transmitting light pulses from said plurality of light receivers to said control means;

each of said light transmitters including optical means for receiving light pulses from said control means through a respective one of said first light conductors and directing said light pulses towards a corresponding one of said light receivers;



each of said light receivers including optical means for receiving light pulses from a corresponding one of said light transmitters and for directing said light pulses through a respective one of said second light conductors to said control means;

said control means including means for evaluating the light pulses received from said plurality of light receivers to determine visibility along said path; and

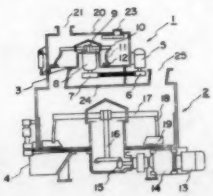
at least one coil of light conductors extending substantially in closely spaced parallel relationship with at least one of said plurality of first light conductors and at least one of said plurality of second light conductors and connected to said control means for compensating temperature-induced variations in the light transmission capacity of said at least one light conductor and said at least one second light conductor.

4,403,863

METHOD FOR PREPARING CONCRETE BY USE OF MULTI-LAYER PAN TYPE MIXER

Takeshi Fukushima, Ichikawashi; Kiyoshi Sakagami, Funabashi-shi, and Yoshihiro Ikegami, Chibashi, all of Japan, assignors to Pacific Metals, Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,897
Claims priority, application Japan, Jul. 12, 1980, 55-95261
Int. Cl.³ B28C 5/16, 7/04
U.S. Cl. 366—8 **6 Claims**



1. A method for producing concrete in a multi-layer pan type mixer comprising upper and lower mixing tanks driven by separate motors and a discharge gate communicating the upper mixing tank with the lower mixing tank, said method comprising supplying sand, cement and primary mixing water into the

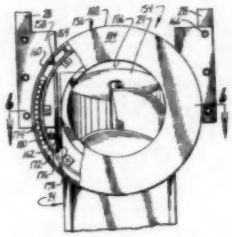
upper mixing tank to perform primary mixing therein to obtain a mortar, said primary mixing water being in a quantity which is suitable for said primary mixing and necessary to ensure that said mortar has substantially predetermined properties, discharging said mortar into the lower mixing tank, simultaneously supplying gravel and secondary mixing water into the lower mixing tank to disperse the gravel in said mortar, said secondary mixing water being in a quantity which is equal to the quantity of water required to obtain desired properties, less that quantity primary mixing water introduced into the upper mixing tank, and performing secondary mixing in the lower mixing tank.

4,403,864

SUPPORT DEVICE FOR MIXER AUGER

Joseph F. Stastny, Indianola, Iowa, assignor to Cemen, Tech, Inc., Indianola, Iowa

Filed Apr. 16, 1982, Ser. No. 369,149
Int. Cl.³ B28C 7/06
U.S. Cl. 366—19 **5 Claims**



1. An auger support assembly comprising:
a support structure,
an outer circular collar having a vertical circular surface presented radially inwardly,
a first annular horizontal flange affixed to said inwardly presented vertical circular surface and protruding radially inwardly therefrom;
an inner circular frame having a vertical circular surface presented radially outwardly towards said inwardly presented vertical circular surface of said outer collar;
a second annular horizontal flange affixed to said outwardly presented surface and protruding outwardly therefrom;
said first and second annular flanges being in vertical alignment with one another,
a plurality of ball bearings positioned between said first and second annular flanges and being in rolling engagement with said first and second annular flanges whereby said outer collar and said inner collar may rotate about a vertical axis with respect to one another by virtue of the bearing engagement between said first and second flanges and said ball bearings,
said outer collar being fixed to said support structure;
auger means connected to said inner collar.

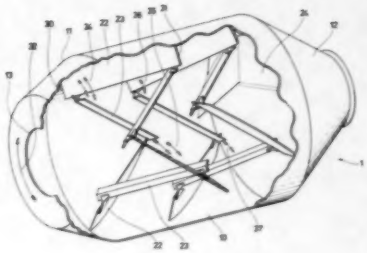
4,403,865

DEVICE IN CONNECTION WITH MIXING APPARATUSES

Bernhard V. Fejmert, Nordostpassagen 19, S-413 11 Göteborg, Sweden

PCT No. PCT/SE79/00138, § 371 Date Feb. 4, 1981, § 102(e) Date Feb. 4, 1981, PCT Pub. No. WO80/02808, PCT Pub. Date Dec. 24, 1980
PCT Filed Jun. 18, 1979, Ser. No. 233,609
Claims priority, application Sweden, Dec. 19, 1977, 77/14394
Int. Cl.³ B28C 5/20
U.S. Cl. 366—44 **6 Claims**

1. A mixing apparatus having a rotatable drum with an essentially horizontal axis of rotation and having an input end for the input of material to be mixed, and a discharge end for the discharge of the mixed material, and with a shell which supports a plurality of first mixing wings in a screw-like arrangement, so that during rotation of the drum in a first direction, the mixing direction, said mixing wings convey the material in axial direction towards the input end and during the rotation in a second, opposite direction, the discharge direction, said mixing wings feed the material in axial direction towards the discharge end, and a plurality of second mixing wings having a V-shaped cross section so as to form a chute-shaped first side which is directed towards said discharge end, and a roof-like second side, said plurality of second mixing wings being respectively attached to said plurality of first wings in such a position that the chute-shaped first sides of said second wings are below the first wings when said second wings as a consequence of rotation of the drum in said first direction are in an angular position so that material carried along by said first wings slides off the same and hits the chute-



shaped first side of the second wings therebelow, said second wings having such a screw-form that because of their inclination they convey the material in a direction towards the discharge end whereby the material gets a double directed axial movement, one in a direction towards the input end by the action of the first wings and one in a direction towards the discharge end as a result of the action of the second wings, said second wings also being respectively attached to said first wings in such a position that the roof-like second sides of said second wings are below the first wings so that as a consequence of rotation of the drum in the second direction the material falling down on the roof-like second side from the first wings leaves the second wings in a movement that is transversal to the second wings, so that the transportation by means of the second wing takes place in axial direction in connection with a rotation in substantially the mixing direction only, and the movement of the material in the discharge direction during a corresponding rotation by action of the first wings is substantially unaffected by the second wings.

4,403,866

PROCESS FOR MAKING PAINTS

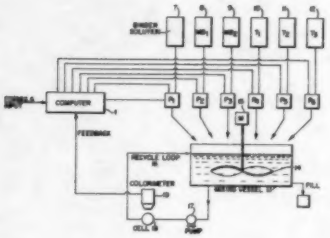
Allan F. Falcoff, Lake Orion, Mich.; Stephen W. Rementer, Toughkenamon, Pa., and Allan B. J. Rodrigues, Bloomfield Hills, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 7, 1982, Ser. No. 376,233
Int. Cl.³ B01F 5/10, 15/00, 15/02
U.S. Cl. 366—132 **20 Claims**

1. A process for making a paint that matches the color values of a standard liquid paint, said process utilizes a computer electrically connected to a multiplicity of metering pumps, each pump being individually connected to a supply of a component used in the paint, said components used in the paint being liquid containing binder for the paint, solvent for the paint and colorant in the form of dispersions or solutions, a vessel containing a recycle loop and mixing means, a pump tubularly connected to the vessel positioned in a recycle loop,

a cell having a viewing window positioned in the recycle loop, a colorimeter having means to determine L*, a* and b* values of the paint positioned to view the window of the cell and being electrically connected to the computer, said process being controlled by the computer comprises the following steps:

(1) providing the computer with
  (a) formula of the paint,
  (b) L*, a* and b* values of the liquid standard paint,
  (c) tolerance values of L*, a* and b* for the paint;
(2) metering exact amounts of components of the paint into the mixing vessel by the metering pumps which are being controlled by the computer;
(3) mixing said components to form a paint;
(4) circulating the paint through said cell at a uniform shear rate;
(5) measuring and determining L*, a* and b* values of the paint with the colorimeter;



(6) transmitting said L*, a* and b* values to the computer;
(7) determining color vectors of each colorant used to formulate said paint by adding a known amount of each colorant to the paint and for each addition repeating Steps (3)–(6) and determining the change in L*, a* and b* values;
(8) comparing by the computer the L*, a* and b* values of the paint to the L*, a* and b* values of the standard paint and calculating the difference between the values of the paint and the standard paint, and calculating the quantity of components to be added to the paint to bring the paint within L*, a* and b* tolerance values of the paint; and
(9) repeating steps (2)–(6) and (8) at least once in the event the paint is not within the L*, a* and b* tolerance values for the paint to bring the paint within these tolerance values.

4,403,867

INK AND WATER TESTER

Horace Duke, 1001 Massman Dr., Nashville, Tenn. 37217

Filed Oct. 20, 1980, Ser. No. 198,635

Int. Cl.³ B01F *15/00*

U.S. Cl. 366—142 **6 Claims**

1. Apparatus for testing the water absorption ability of a material comprising:

container means suitable for rotating, and receiving a selected quantity of water absorbent material and a selected quantity of water;

a base support suitable for rotating and supporting said container means;

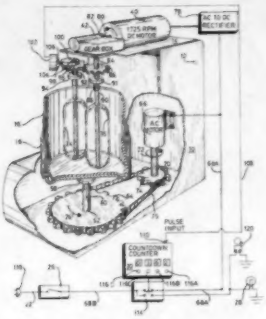
rotating agitator means suitable for being received by said container and for mixing and agitating said water absorbing material and water;

an upper support for rotatably supporting said agitator means, said upper support being mounted to said base support such that said agitator means is positioned within said container means at a position suitable for mixing and agitating said water absorbent material and water;

first drive means supported by said upper support for rotating said agitator means at a first selected rate;

means for counting the number of revolutions of said agitator means;

second drive means supported by said base support for rotating said container means at a second selected rate to assure said agitator means contacts all said water absorbent material in said container means; and



circuitry connected to said means for counting, for interrupting electrical power to said first drive means when said agitator has completed a selected number of revolutions.

4,403,868

AGITATOR WITH TWO SETS OF BLADES EACH DRIVEN IN AN OPPOSITE DIRECTION ABOUT A COMMON AXIS

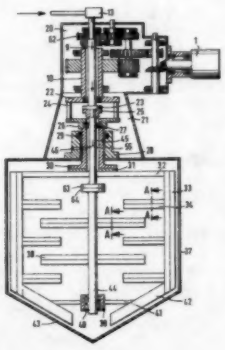
Dieter Kupka, Postfach 59, Binger Landstr. 37a, 6750 Kirn, Fed. Rep. of Germany

Filed Jul. 14, 1981, Ser. No. 283,126

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027567

Int. Cl.³ B01F *7/18*

U.S. Cl. 366—295 **16 Claims**



1. An agitator for stirring flowable material, said agitator being arranged to be tightly positionable on a vessel, such as a pressure vessel, and comprising a first agitating element and a second agitating element each driven in an opposite rotational direction about a common axis, said first agitating element includes an inner agitating shaft, said second agitating element extends around said first agitating element and includes a tubular outer agitating shaft laterally enclosing said inner agitating shaft, each of said first and second agitating elements supporting agitating blades for producing different flow characteristics in the material to be stirred depending on the application of

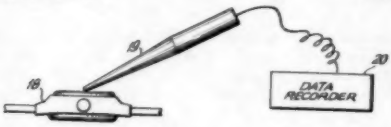
the material, a housing enclosing said inner and outer agitating shafts and within said housing said inner agitating shaft is sealed relative to said outer agitating shaft and said outer agitating shaft is sealed relative to said housing, wherein the improvement comprises that a slide ring seal unit provides the seal between said inner and outer agitating shafts and between said outer agitating shaft and said housing and comprises two axially coextensive plural component slide ring seals one located within the other and both enclosed by said housing with one of said plural component slide ring seals located between said inner agitating shaft and said outer agitating shaft and the other one of said plural component slide ring seal positioned between said outer agitating shaft and said housing.

4,403,869

ELECTRO-OPTIC IDENTIFICTION CODE SYSTEM IN A TIMEPIECE

William C. Crutcher, Middlebury, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Aug. 18, 1980, Ser. No. 179,383
Int. Cl.³ G04B *47/00*; G04C *17/00*
U.S. Cl. 368—10 **6 Claims**



1. In an electronic timepiece of the type having a timebase including an oscillator and countdown divider providing timing pulses, timekeeping means connected to said divider and periodically advanced by said pulses to keep time and to store time information, and display means connected to said timekeeping means and adapted to visually display the time, the improvement comprising:

an electro-optic portion on said timepiece actuable between at least two optical states wherein said electro-optic portion comprises a section of closely spaced, parallel, separately actuatable segments;

memory means inside the timepiece storing a plurality of identification codes in binary form;

means for selecting one of said identification codes to be transmitted and indicating the selection on said display means; and

means for selectively transferring at least one selected identification code from said memory means to said electro-optic display portion and optically displaying said code in machine-readable binary form on the electro-optic display portion so that the codes stored in said memory means separately actuate the segments in a bar code format adapted to be read by moving an opto-electronic scanner past the segments.

4,403,870

WATER-RESISTANT SHAPED CASE CONSTRUCTION FOR A WRISTWATCH

Harwell B. Thompson, Cheshire, and Paul Wuthrich, Watertown, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

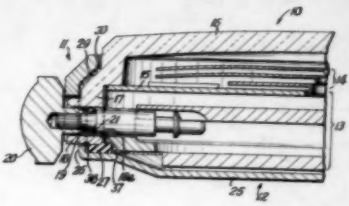
Filed Jan. 11, 1982, Ser. No. 338,762
Int. Cl.³ G04B *37/00*, *39/00*
U.S. Cl. 368—294 **7 Claims**

1. In a wristwatch of the type having a bell-shaped crystal with a central viewing portion and an integral depending wall with an integral pendant, a bezel of thin substantially uniform wall thickness surrounding and generally conforming to portions of the crystal wall, and a caseback having a central portion and a peripheral wall surrounding and generally conforming to portions of the crystal wall, the improvement comprising:

a peripheral clamping shoulder on the crystal cooperatively associated with a clamping ledge on said bezel,

snap-fit attachment means between the bezel and the case back wall,

a gasket disposed between first and second sealing surface defined by spaced portions of the crystal and caseback,



whereby said gasket is compressed by being urged toward the gasket by the bezel acting on said clamping shoulder and retained by said snap-fit attachment between the bezel and the caseback,

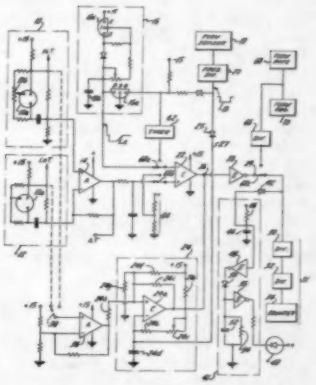
said crystal further including a movement-limiting shoulder defined on the crystal and adapted to cooperate with portions of the caseback to limit movement of the crystal toward the caseback and thereby control the spacing between said first and second sealing surfaces.

4,403,871

HEAT-METER AND FLOW-METER APPARATUS

Murray F. Feller, Dunnellon, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Division of Ser. No. 258,521, Apr. 29, 1981. This application Sep. 22, 1982, Ser. No. 421,053
Int. Cl.³ G01F *19/00*
U.S. Cl. 374—1 **6 Claims**



1. Heat metering apparatus for a system having a heat exchanger, an inlet passage, an outlet passage and means for moving fluid through said inlet passage, said heat exchanger and said outlet passage serially, said heat metering apparatus including a flow sensor at one of said passages operative to produce a series of pulses in response to fluid flow, a pair of temperature sensors located at said inlet and outlet passages, respectively, temperature difference means for taking the difference between the outputs of said temperature sensors, an

oscillator, a heat meter, product-taking means responsive to both said flow sensor and said temperature difference taking means for enabling the oscillator to supply trains of pulses to the heat meter at intervals determined by said flow sensor for durations determined by said temperature difference taking means, and monitoring means including an indicator responsive to output pulses from said product-taking means for indicating whether the temperature sensors are virtually alike when both are subjected to the same temperature and for monitoring the flow rate.

4,403,872

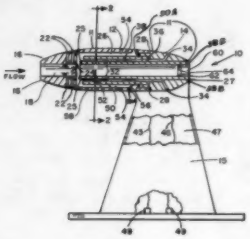
FLOW DEVICE FOR SENSORS

Richard V. DeLeo, Hopkins, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 296,196, Aug. 25, 1981, abandoned, which is a continuation of Ser. No. 91,179, Nov. 5, 1979, abandoned. This application Nov. 3, 1982, Ser. No. 438,792

Int. Cl.³ G01K *3/02*

U.S. Cl. 374—138 **17 Claims**



1. A device for measuring a parameter in a fluid stream comprising a housing having an exterior and having:

an elongated longitudinal exterior shape and a bore defined in the housing along the shape for flow of the fluid stream therethrough;

a leading portion at a first end of the bore;

a trailing portion at a second end of the bore;

the exterior shape being contoured convex at the leading portion;

restriction means in the bore for internal flow regulation;

first plurality of port means from the bore to the exterior of the housing in the leading portion for providing boundary layer control;

first annular fluid passageway means in the housing downstream of the first port means outboard of the bore and coupled to the bore upstream of the restriction means and ported to the exterior to cooperate with the bore to provide a lower pressure area for the fluid which flows into the first passageway means; and

sensor means to measure the parameter supported in the first passageway means between the coupling to the bore and the porting to the exterior.

4,403,873

TILTING PAD THRUST BEARING

Willis W. Gardner, Waukesha, Wis., assignor to Waukesha Bearings Corporation, Waukesha, Wis.

Filed Jan. 11, 1982, Ser. No. 338,753

Int. Cl.³ F16C *17/06*

U.S. Cl. 384—306 **3 Claims**

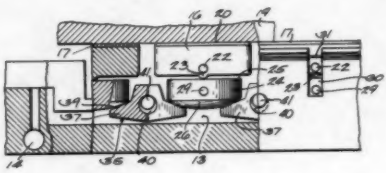
1. A tilting pad thrust bearing comprising:

retainer means,

a plurality of bearing pads arranged in said retainer means in circumferentially spaced apart relationship about an axis of rotation, each pad having a surface for interfacing with and supporting a planar rotating member when the bearing is in use and each pad having a rib projecting axially in a direction opposite of said surface and extending radially over a substantial portion of the radial width of the pad, said pads being tiltable to a limited extent relative to said planar rotating member to develop lubricant wedges when said member rotates,

a plurality of circumferentially spaced apart disks each having a planar surface on which the respective ribs make radial line contact and each having a spherical surface presented in a direction axially opposite of its planar surface,

a plurality of link members each of which is positioned between a pair of said disks, and each of which has a



radially extending round hole and wing portions extending in opposite circumferential directions away from the hole, the spherical surface of any disk being in tangential point contact with wing portions of two adjacent disks, and

round pins mounted to said retainer means and extending radially through the holes in the respective link members for supporting said link members pivotally, the outside diameter of the pins being substantially less than the diameter of the holes for the pins and holes to contact each other tangentially on a radially extending line.

4,403,874

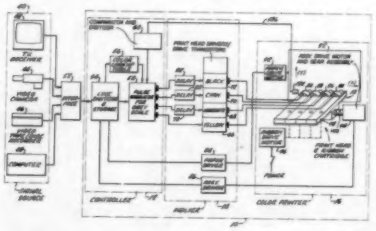
COLOR PRINTER AND MULTI-RIBBON CARTRIDGE THEREFOR

Errol G. Payne, Irvine; Charles D. McGregor, Santa Ana, and Tim M. Uyeda, South San Gabriel, all of Calif., assignors to Ramtek Corporation, Santa Clara, Calif.

Filed Mar. 25, 1980, Ser. No. 133,889

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—124 **14 Claims**



1. An impact printer for producing color characters and drawings on a media, comprising:

(a) a print head assembly including a plurality of independently actuable impact print heads serially arranged along a printing direction, each print head having a different colored printing ribbon associated therewith, each ribbon having a portion disposed between the associated print head and the media;

(b) means for causing relative movement between the print head assembly and the media along the printing direction such that each of said impact print heads is capable of impacting coextensive areas of the media;

(c) means for moving each ribbon past the associated print heads;

(d) a signal source for providing electronic signals which represent, on a point-by-point basis, the color content of the characters and/or drawing to be printed;

(e) indexing means for enabling each print head to sequentially mark the media at preselected positions; and,

(f) control means responsive to said signal source for selectively causing said indexing means to actuate the print heads at each preselected position along the printing direction depending upon the color content of said electronic signals, thereby causing a preselected colored combination marked on the media.

4,403,875

ARMATURE SUPPORT DEVICE OF A PRINT HEAD

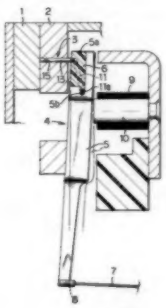
Kiyomitsu Asano, Musashino; Toshikatsu Kondo, Nagoya; Masao Jozuka, Nagoya, and Atsuo Sakaida, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi and Nippon Telecommunication Engineering Company, Tokyo, both of, Japan

Filed Nov. 20, 1981, Ser. No. 323,694

Claims priority, application Japan, Nov. 25, 1980, 55-165492

Int. Cl.³ B41J 3/12

U.S. Cl. 400—124 12 Claims



1. An armature support device of a print head pivotally supporting an armature at one end thereof, the armature holding a print wire at the other end thereof and having a base portion adjacent said one end, said support device comprising:

a support member; and

a spring member made of a resilient wire material and including a fixed portion secured to said base portion of the armature, a pair of coaxial arm portions extending in opposite directions from said fixed portion, and a pair of leg portions extending from said coaxial arm portions respectively and fixed to said support member, said fixed portion and substantive parts of the arm portions being imbedded in said base portion of the armature such that said substantive parts of the arm portions are twistable in said base portion, said spring member normally holding said armature at a predetermined position, said fixed portion being pivotable together with said base portion about said arm portions which act as a pivoting fulcrum when said armature is pivoted away from said predetermined position, whereby said arm portions are twisted to produce thereon a torsional force acting to restore said armature to said predetermined position.

4,403,876

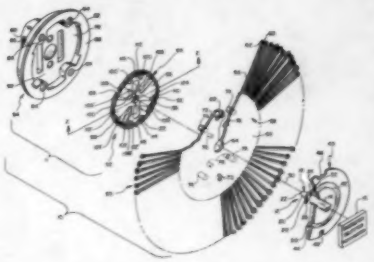
PRINT ELEMENT MOUNTING APPARATUS

Kenneth D. Vought, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,527

Int. Cl.³ B41J 1/08

U.S. Cl. 400—144.2 1 Claim



1. A print element mounting apparatus for enabling a print disc to be removably attached to a selector shaft in a printing machine, the shaft having a nose portion and a mounting portion, the apparatus comprising:

a flat disc-shaped flex member carried by the print disc,

said flex member including;

a pair of yieldable sections,

a pair of rigid sections, and

flex joint means connecting said yieldable sections to said rigid sections for permitting said yieldable sections to expandably move relative to each other;

said flex joint means comprising a first pair of bendable arms connecting one of said pair of yieldable sections to both of said rigid sections and a second pair of bendable arms connecting the other one of said pair of yieldable sections to both of said rigid sections; and

biasing means operatively engaging said flex member so as to continually urge said yieldable sections towards a closed position and, said yieldable sections engagingly clamping about the mounting portion of the shaft under tension when attached thereto and engagingly riding over the nose portion when axially removed therefrom, the tension from said biasing means easily overcome to afford easy removal of the print element from the shaft.

4,403,877

SNUBBED ANCHORING APPARATUS

John E. Jones, Manhattan Beach, Calif., and Vittorio R. Castelli, Scarsdale, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 138,631, Apr. 8, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 372,883

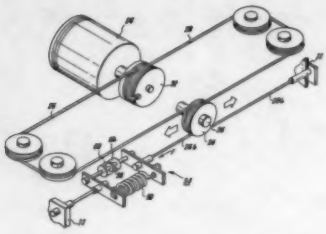
Int. Cl.³ B41J 19/00

U.S. Cl. 400—335 3 Claims

1. In an apparatus including a flexible force transmitting member and a stationary member,

characterized in that an end of the flexible force transmitting member is connected to the stationary member by connector apparatus which maintains a substantially constant tension on said flexible force transmitting member, said connector apparatus consisting of a snubbing device containing a high viscosity material and a spring, the snubbing device being connected between the spring and the flexi-

ble force transmitting member such that the spring exerts a force along the length of said force transmitting member



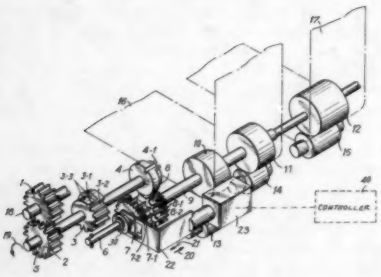
at all times whereby the tension on said force transmitting member remains substantially constant.

4,403,878

PAPER-FEEDING MECHANISM OF A SMALL-SIZED PRINTER

Hiroshi Hosogaya, Shiojiri, Japan, assignor to Epson Corporation, Shiojiri, Japan

Continuation of Ser. No. 11,722, Feb. 12, 1979, abandoned. This application Mar. 4, 1981, Ser. No. 240,450
Claims priority, application Japan, Feb. 10, 1978, 53-14598
Int. Cl.³ B41J *11/48, 11/50*
U.S. Cl. 400—585 **4 Claims**



1. A paper-feeding mechanism for a small sized printer having at least two paper sheets for printing thereon, comprising:

a first roller for frictional engagement with a first paper sheet, rotation of said first roller causing said first paper sheet to feed, said first roller being attached to a first shaft for rotation therewith;

a second roller for frictional engagement with a second paper sheet, rotation of said second roller causing said second paper sheet to feed, said second roller being attached to a second shaft for rotation therewith, said first shaft and said second shaft being coaxial;

a first gear attached to and rotating with said first shaft;

a second gear attached to and rotating with said second shaft;

a third gear, said third gear being adapted to selectively engage and drive either said first gear or said first and second gears in unison, and having teeth on only a minor portion of the circumference thereof, engagement between said first and third gears occurs only during a small angle of rotation of said third gear, and said paper sheets are stationary for printing thereon for substantially the entire rotation of said third gear;

a fourth gear, said fourth gear having teeth on only a minor portion of the circumference thereof, when said second and fourth gears are aligned, engagement between said second and fourth gears occurs only during a small angle of rotation of said fourth gear, and said second paper sheet remains stationary for printing thereon for substantially the entire rotation of said fourth gear;

means for rotating said third and fourth gears, attached to and rotating with a third shaft;

means for releasably engaging said first and second gears for rotation in unison; one rotation of said third gear producing a partial rotation of said first and second gears, whereby said first and second paper sheets are advanced;

means for translating said second gear out of engagement with said first gear and into alignment and releasable engagement with said fourth gear, one rotation of said fourth gear, when engaged to said second gear, producing rotation of said second gear exceeding the rotation produced by one rotation of said third gear; when said first and third gears are engaged and said second and fourth gears are engaged and third and fourth gears each make one rotation, said second paper sheet is advanced more than said first paper sheet is advanced; and

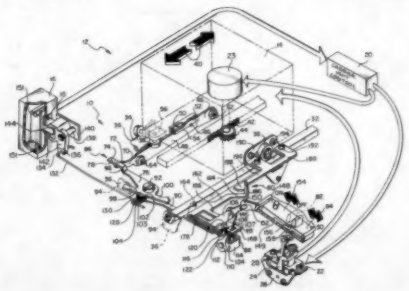
control means for timing the translation of said second gear, said control means translating said second gear to oppose the untoothed major portion of said fourth gear during toothed engagement of said first and third gears, while said second gear is translated to engage for said rotation in unison when teeth of said first and third gears are disengaged, said first paper is fed and said second paper is stationary during a full rotation in unison of said third and fourth gears.

4,403,879

CARRIER LOCKING DEVICE

Kenneth D. Vought, Cortland, and Steven M. Faes, Homer, both of N.Y., assignors to SCM Corporation, New York, N.Y.

Filed May 6, 1981, Ser. No. 261,324
Int. Cl.³ B41J *29/56*
U.S. Cl. 400—674 **24 Claims**



1. A carrier locking device for a typewriter having a frame structure, a carrier supported for movement along the frame structure, and means for moving the carrier and capable of stopping the carrier at a predetermined location along the frame structure, the carrier locking device comprising:

a carrier locking means supported on the frame structure and with the carrier stopped in the predetermined location said carrier locking means being operable between a locked position for preventing movement of the carrier from the predetermined location and released position for enabling the carrier moving means to move the carrier away from the predetermined location;

a lock control means operatively connected to said carrier locking means and selectively movable between a first position with said carrier locking means in said locked position and a second position to permit said carrier locking means to move from said locked position to said released position; and

sensor means interposed between the carrier and said lock

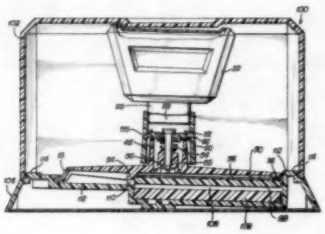
control means and operable to conjunction with the carrier at different locations for determining selective movement of said lock control means, said sensor means operable in response to the carrier being stopped in the predetermined location to permit selective movement of said lock control means between said first and said second positions, and with said lock control means in said second position said sensor means operable in response to the carrier being away from the predetermined location to block movement of said lock control means to said first position.

4,403,880

RECORD CLEANER/CONDITIONER

Joseph Sandor, Reseda, and Claude P. Davis, Woodland Hills, both of Calif., assignors to California Sounds Ltd., Chatsworth, Calif.

Continuation of Ser. No. 64,503, Aug. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 863,897, Dec. 23, 1977, Pat. No. 4,166,626. This application Mar. 13, 1981, Ser. No. 243,624
The portion of the term of this patent subsequent to Sep. 4, 1996, has been disclaimed.
Int. Cl.³ G11B *3/58*
U.S. Cl. 401—134 **14 Claims**



1. A record cleaning/conditioning device and associated container comprising:

a container for holding said device in a predetermined position;

an elongated arm member having cleaning means disposed on one side thereof for engaging and cleaning the surface of a record so as to remove dirt and other undesirable contaminants therefrom, said arm member configured such that when said device is disposed in said container, said arm member is inclined downwardly toward the outer periphery of said container;

a housing coupled to said arm member such that said device can be selectively rotated about a record to be cleaned;

a fluid reservoir coupled to said housing for supplying said cleaning means with a cleaning/conditioning fluid; and

means disposed in said housing for regulating the flow of said fluid to said cleaning means.

4,403,881

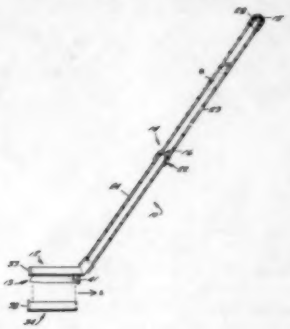
HAND HELD HERBICIDE APPLICATOR WITH FLEXIBLE CAP AND VALVE ELEMENT

John H. Keeton, P.O. Box 296, Campbellsville, Ky. 42718

Filed Jul. 16, 1981, Ser. No. 283,879
Int. Cl.³ B43K *5/00*; A01M *21/00*
U.S. Cl. 401—202 **8 Claims**

1. A liquid applicator comprising

a head portion including a sponge liquid applicator material and means for holding said sponge so that part of said sponge is within said head portion, and part of said sponge extends outwardly from the head portion, and said sponge has generally a figure 8 shape in end view, said means for holding said sponge comprising: means defining a slot in said head portion elongated in the same dimension as the dimension of elongation of said head portion; and further comprising a cover for said sponge portion extending outwardly from said head portion, said cover comprising an elongated generally tubular piece of plastic pipe circular in cross-section and open at one end and having means defining a slot therein, said slot elongated in the same dimension as the dimension of elongation of said cover; and wherein said head portion and said cover have means defining exterior surfaces thereof adjacent said slots, which surfaces substantially abut each other when said slots and said cover and said head portion are adjacent each other and extend in the same dimension, with said cover engaging and surrounding said portion of said sponge extending outwardly from said head portion;



a handle portion operatively connected at one end thereof to said head portion, the other end being free;

valve means consisting of fluid pressure responsive valve means operatively positioned between said liquid applicator material and said handle free end;

means defining a liquid reservoir adjacent said valve means, with liquid in contact with said valve means on the opposite side thereof as said liquid applicator material; and

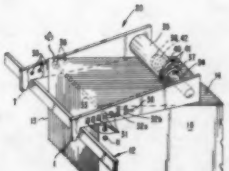
air pump means for pressurizing liquid in said reservoir to pass only a predetermined amount thereof through said pressure responsive valve means into contact with said liquid applicator material.

4,403,882

HANGER-BINDER

Michael P. Fleck, Grayrock Rd., Clinton, N.J. 08809

Filed Jul. 17, 1981, Ser. No. 284,325
Int. Cl.³ A47B *63/00*; B42F *15/00*
U.S. Cl. 402—4 **6 Claims**



1. A binder hanger for binding and hanging sheet materials comprising:

(a) Two side members each of which has a hook at one end to engage a suspension means;

(b) a binder member rotatably and slidably attached to one of the side members of sufficient length to span the distance between the side members for binding the sheets between the side members; and

(c) a cross member which joins the side members at their ends opposite from where the hooks are located.

4,403,883

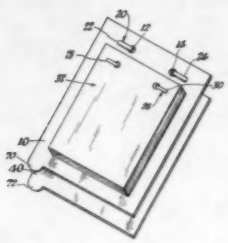
PAPER FASTENER DEVICE SYSTEM

Georgia L. Sorin, 2009 N. Park Rd., Hollywood, Fla. 33021

Continuation of Ser. No. 98,833, Nov. 30, 1979, abandoned. This application Sep. 11, 1981, Ser. No. 301,182

Int. Cl.³ B42F *13/00*

U.S. Cl. 402—79 **1 Claim**



1. A paper fastener system for supporting filed items comprising:

file member for storing the filed items,

a plurality of carrier means each including a body portion,

a first connecting means connected to and between said file member and each said paper carrier means, and

a second connecting means connected to each said body portion and spaced apart from said first connecting means,

said first connecting means including a foldable metal fastener and holes in each body portion for removably connecting said paper carrier means to said file member, whereby the filed items removably connected on one said body portion may be removed separately without removal of other filed items on another paper carrier means,

at least two holes in each said body portion for removably connecting each said paper carrier means from said file member,

each said second connecting means includes at least two connecting openings spaced apart from said first connecting means, and a mating item fastener means for connecting each said body portion to said filed items on each said paper carrier means,

said mating item fastener means is a foldable flat metal paper fastener,

said body portion is a card, and

said card includes an index tab.

4,403,884

WIRE ASSEMBLIES FOR REPETITIVE, CONTINUOUS CYCLE, TENSILE LOAD CONDITIONS, PARTICULARLY SUCKER RODS FOR OIL WELLS

Kenneth C. Barnes, Orange Park, Fla., assignor to Florida Wire and Cable Company, Jacksonville, Fla.

Filed Mar. 18, 1981, Ser. No. 245,139

Int. Cl.³ B25G *3/28;* **F16G** *11/00*

U.S. Cl. 403—284 **21 Claims**

1. A sucker rod section assembly for connection with other sucker rod sections to form a sucker rod string for use in actuating a pump in a well, said sucker rod section assembly comprising:

an elongate metallic member of multi-wire steel strand;

first and second end pieces mounted on the ends of said elongate member;

each end piece having means for connection with an end piece of an adjacent section to form a sucker rod string;

at least one of said end pieces comprising a steel body having a passageway formed therein and opening from one end thereof, one end portion of said steel strand being disposed in said passageway and embraced by the passageway walls, said steel body being substantially continuously deformed into gripping engagement with said end portion of said steel strand, said deformation being continuous but non-uniform such that the degree of gripping engagement over at least part of the length of said end portion continuously and progessively increases (in progressing) in the direction from the open end of said passageway toward the terminal end of said end portion of the steel strand such that when said one end piece and said steel strand are placed under tensile load there is a relatively gradual and continuously progressive transfer of load from the steel strand to said one end piece along said end portion, and hence a continuous relatively gradual load transition in the end portion of said steel strand so as to reduce the possibility of fatigue failure under repetitive tensile loading.

4,403,885

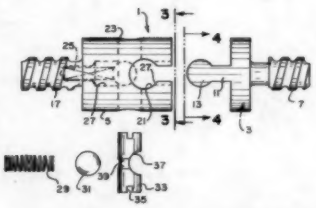
CABLE CONNECTOR

Larry F. Babb, Lorain County, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 9, 1981, Ser. No. 252,312

Int. Cl.³ F16D *1/00*

U.S. Cl. 403—317 **15 Claims**



1. In a cable connector for flexible rods or the like, said connector including a first coupling member and a second coupling member, each of said coupling members including means at one axial end thereof for connecting said member to a flexible rod or the like,

said first member comprising, at the second axial end thereof, a transversely elongated male member having a neck and an enlarged head, said head having an aperture through it generally perpendicular to the direction of its elongation,

said second member comprising, at the second axial end thereof, a transverse slot proportioned to receive said head and neck of said first member for preventing axial separation of said first and second members when said head is in said slot, said second member further comprising a transverse bore extending generally perpendicular to said slot, said bore and said aperture in said head being at least partially aligned when said male member is received in said slot, and

a pin positionable through said bore and said aperture to lock said first and second members by preventing sliding movement of said male member in said slot,

the improvement wherein said aperture in said head of said first member extends through said second axial end of said first member, wherein said bore in said second member intersects a portion only of said slot, wherein said pin

incudes a cut-out on a lateral side thereof, said cut-out being sized to permit said male member to slide out of said slot when said cut-out is generally aligned with said slot, wherein said pin is movable in said bore from a locking position in which it prevents separation of said male and female members to an unlocking position in which said cut-out is generally aligned with said slot, wherein said second member comprises an axially extending blind bore opening into said bore for said pin, and wherein said second member further comprises detent means for holding said pin in said bore, said detent means comprising a coil spring in said blind bore.

4,403,886

NOVEL MORTISE-AND-TENON TYPE JOINT FOR FURNITURE

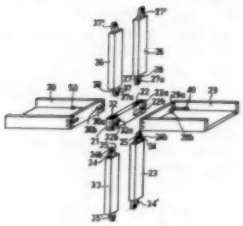
Roland Haeusler, 14 rue Adrien Damalix, 94410 St Maurice, France

Filed Mar. 5, 1982, Ser. No. 355,111

Claims priority, application France, Mar. 10, 1981, 81 04746

Int. Cl.³ F16B *1/00*; F16D *1/00, 3/00*

U.S. Cl. 403—217 **13 Claims**



1. A mortise-and-tenon type joint system for assemblying three or more components together, said mortise-and-tenon joint system comprising mortise means defining at least one cavity means formed in a first component and a pair of tenon means formed on two other components, respectively, said cavity means and tenon means being of mating configuration, said pair of tenon means being received in said cavity means in opposed relation with a mutual contact surface inside said cavity means, and the volume of said pair of tenon means being substantially equal to the internal volume of said cavity means.

4,403,887

METHOD OF COVERING THE SUMP OF UNDERGROUND CAVITIES

Karl Gloria, Hattingen; Alexander-Barbu Costinescu-Tataranu, Essen; Wilhelm Schuster, and Jürgen Wittekind, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

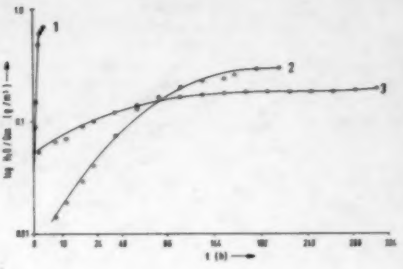
Filed Jun. 2, 1981, Ser. No. 269,736

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021064

Int. Cl.³ B65G *5/00*

U.S. Cl. 405—53 **5 Claims**

1. A method of producing an underground cavity with a sump in a salt dome to store gaseous or liquid non-aqueous substances, said method comprising in combination the steps of introducing water into the salt dome to form brine, removing as much brine as possible leaving the sump therein, and covering said sump with a layer of highly viscous crude oil which is at least 1 cm thick below the stored substances to form a separation layer between the stored substances and the brine sump to prevent any transition of water respectively water vapor from the sump into the stored substances, said crude oil containing at most 7% hydrocarbons having up to 5 C-atoms in a molecule thereof, said crude oil being heavier than the stored



substances though lighter than the brine sump and having a specific gravity at 20° C. of at most 1.2 g/cm³.

4,403,888

OIL CONTAINMENT BOOMS

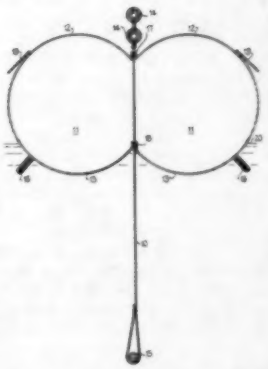
Raymond G. Teasdale, Bath, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 2,304, Jan. 10, 1979, Pat. No. 4,325,653. This application Apr. 1, 1981, Ser. No. 249,862

Claims priority, application United Kingdom, Jan. 12, 1978, 1318/78

Int. Cl.³ E02B *15/04*

U.S. Cl. 405—68 **10 Claims**



6. A restowable oil containment boom including double side-by-side buoyancy chambers, each chamber having an outer wall consisting of upper and lower wall portions defining a longitudinal fold region therebetween, means for pressurizing the chambers, a longitudinal skirt having upper and lower portions extending respectively upwardly and downwardly from between respective points of attachment of the buoyancy chambers and an inner wall portion extending between said points of attachment, the upper and lower portions of said skirt having laterally thickened upper and lower edge regions respectively, the length of the upper wall portion exceeding the length of the lower wall portion by an amount equal to the length of said inner wall portion so that each chamber may lie substantially flat against a respective side of the skirt when the boom is deflated, the said upper and lower edge regions being thicker than and accommodating therebetween the buoyancy chambers when deflated and reeled thereby facilitating unreeling and reeling of the boom during deployment and recovery

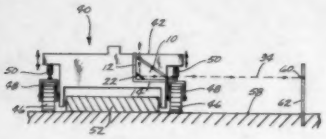
thereof, and means for tensioning the lower portion of the skirt after deployment of the boom.

4,403,889

GRADE CONTROL ALIGNMENT DEVICE AND METHOD

John A. Gillotti, 4103 SW. 34 St., Des Moines, Iowa 50315

Filed Jun. 8, 1981, Ser. No. 271,520
Int. Cl.³ E01C *19/00, 3/06*
U.S. Cl. 404—72 **8 Claims**



6. A method for controlling the grade of a working implement of a machine, wherein said machine includes means for automatically controlling the grade of a working implement of the machine as the machine travels over a surface and means for overriding said automatic grade control means, wherein the automatic grade control senses and is responsive to the relative position of the working implement with respect to a first grade reference line disposed on a first transverse side of the machine, and said first grade reference line being disposed substantially parallel to the direction of travel of the machine, the method comprising the steps of:

mounting a visual alignment device on said machine, said alignment device including a sighting reference and means for adjusting said alignment device to visually align a grade reference line and said sighting reference; said sighting reference including a support structure attached to said machine, a first sight pin attached to said support, and a second sight pin attached to said support and spaced from said first sight pin, such that said first and second sight pins are angularly sighted and visually aligned with a grade reference line; and said support including a first section and a second section angularly disposed with respect to said first section, and wherein said first sight pin is attached to said first section and said second sight pin is attached to said second section;

actuating the automatic grade control;

adjusting said alignment device to visually align said grade reference line and said sighting reference;

periodically viewing the alignment device to determine if the visual alignment of the grade reference line and the sighting reference is maintained as the machine travels over a surface; and

actuating said automatic grade control overriding means to adjust the grade of the working implement when said visual alignment is not maintained, to restore said visual alignment.

4,403,890

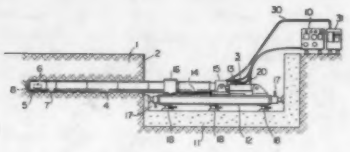
METHOD OF LAYING PIPE UNDERGROUND AND SYSTEM THEREFOR

Naoki Miyanagi, Chiyodamura, and Kojiro Ogata, Ishioka, both of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,107
Claims priority, application Japan, Mar. 9, 1981, 56-32449
Int. Cl.³ F16L *1/00;* **E21B** *3/06*
U.S. Cl. 405—184 **5 Claims**

1. A method of laying a pipe underground wherein the pipe to be laid underground has attached to its leading end a head formed at its front surface with a pointed end to facilitate penetration of the earth and has a propelling force exerted on its rear end so as to obtain penetration of the earth by the pipe, characterized by the steps of:

causing said head to move in vibratory movement, measuring the vibration of the head; and



increasing the propelling force exerted on the pipe when the magnitude of the vibration of the head is high and decreasing the propelling force when the magnitude of the vibration of the head is low.

4,403,891

STABILIZER FOR EXCAVATED SURFACE

Shinkichi Oboka, and Sakae Sano, both of Tokyo, Japan, assignors to Toa Grout Kogyo Co., Ltd. and Mitsui Toatsu Chemicals, Inc., both of Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,447
Int. Cl.³ E02D *3/12*
U.S. Cl. 405—264 **1 Claim**

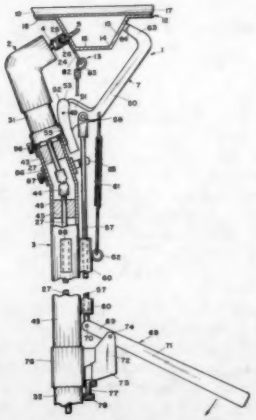
1. The process for stabilizing an excavated surface to provide good membrane formation ability therein and good strengthening and reinforcement of the soil structure adjacent to said surface, comprising adding to said excavated surface a stabilizer consisting of 300 parts by weight of water, 0.1 to 3.0% by weight of highly hydrated beaten natural cellulose fibers, based on the water content of the stabilizer, bentonite, a foaming agent and carboxymethylcellulose.

4,403,892

APPARATUS FOR DRIVING FASTENERS AND OTHER INSERTABLE OBJECTS INTO REMOTE STRUCTURES

Patrick J. Kane, 6725 Caris Rd., Vestaburg, Mich. 48891

Filed Nov. 3, 1980, Ser. No. 202,937
Int. Cl.³ B23B *39/14, 47/30;* **E21C** *9/00, 11/00*
U.S. Cl. 408—95 **32 Claims**



1. An apparatus for driving fasteners, drills, bits and other similar insertable objects into remote, overhead strutures, comprising:

a drive head having means for detachably retaining one such insertable object therein at a predetermined orientation;

means for powering said retaining means to drive the object into a surface of a remotely disposed, overhead structure;

an elongate support having said drive head mounted on one end thereof, with the other support end adapted for grasping; said support having a length sufficient to permit a user to reach a remotely disposed, overhead structure with said drive head;

means for controlling said power means from said support other end;

a clamping arm mounted adjacent said drive head, and being movable with respect thereto for converging and diverging one end of said arm with said drive head; and

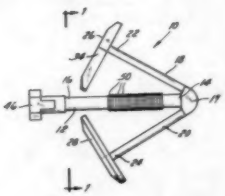
a clamping arm controller mounted on the other end of said support, operable connected with said clamping arm, and including means for opening and closing said clamping arm independently of movement of said support, whereby during object insertion, said support is held so that said clamping arm is positioned abutting a portion of the remote structure disposed generally opposite from the object surface, and said controller is manipulated to converge said clamping arm one end with said drive head to apply tip pressure to the object, and resist reaction forces developed therebetween.

4,403,893

PULL-OUT TYPE EXPANSION FASTENER

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corp., Phillips, Wis.

Filed Mar. 2, 1981, Ser. No. 239,315
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—38 **2 Claims**



1. A one-piece, plastic fastener for lockable engagement in an opening in a workpiece, said fastener comprising a stem having an inner end and an outer end, a pair of arms formed integrally with and extending from said inner end, said arms positioned at an acute angle relative to said stem, said arms each having a free end which terminates in an integrally formed head portion, said head portions being cooperatively engageable to form a complete head having an orifice embracing said stem, said arms being swingable about said inner end of said stem and in a plane containing the axis of said stem, said arms further being biased radially outwardly from said stem in said plane and to said position at an acute angle relative to said stem, said arms being of a smaller width along said plane than in a direction transverse to said plane whereby said arms are readily deformable in said plane and resist deformation in said transverse direction, and wherein said head portions are cooperable along interengageable surfaces that are oblique to said plane, said oblique surfaces upon interengagement tending to translate forces by said radially outwardly biased arms and along said plane into forces transverse to said plane; said arms resisting said transverse forces to thereby resist shiftable movement of said head portions away from each other, said stem and arms being insertable into said opening in said workpiece to locate said head against an outer side of said workpiece, said stem being positively withdrawn outwardly through said opening and said orifice to thereby cause said arms to swing laterally and abut firmly against the inner side of said workpiece, said outer end of said stem having means for engagement by a tool for said outward withdrawal of said stem, and serration means formed on said stem and extending through said orifice and engaging said head to maintain said fastener in said lockable engagement with said workpiece when said stem is forcibly shifted through said opening and orifice.

4,403,894

ROCK BOLT EXPANSION ANCHOR HAVING WINDENED EXPANSION RANGE

Carl A. Clark, Liverpool, N.Y., assignor to The Eastern Company, Naugatuck, Conn.

Filed Feb. 9, 1981, Ser. No. 232,472
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—47 **9 Claims**

1. An expansion anchor assembly for insertion in a rock formation drill hole having a diameter which may vary between relatively wide dimensional limits, said assembly being effective to expand into engagement with the surrounding wall of said drill hole and provide at least a minimum desired holding force over the entire range of dimensional limits of said drill hole diameter, said assembly comprising:

(a) a hollow expansion shell having upper and lower ends and a plurality of portions arranged concentrically about a central axis;

(b) a nut having upper and lower ends and an internally threaded, central opening extending therethrough;

(c) each of said portions having an internal surface facing said central axis and tapered from said upper end of said shell toward said central axis at a first angle for a first axial portion of its length and at a second angle for a second axial portion of its length;

(d) said nut having an external surface tapered from said lower end thereof away from the axis of said opening at a third angle for a first axial portion of its length, substantially equal to the length of said first axial portion of said shell portions, and at a fourth angle for a second axial portion of its length;

(e) said first angle being greater than said second angle, and said third angle being greater than said fourth angle; and

(f) means retaining said shell portions and nut in assembled relation prior to expansion with said lower end of said nut inserted into said upper end of said shell by a distance substantially equal to said first axial portion of the length of each of said shell and nut, the surfaces of said shell and nut in said first axial portions of each being in contact;

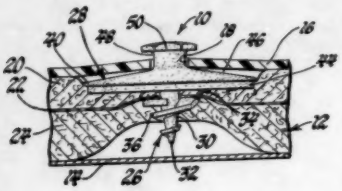
(g) the relative lengths of said first and second axial portions of said shell portions and said nut, and the values of said first, second, third and fourth angles permitting expansion of said assembly from an initial diameter prior to expansion, to a minimum expanded diameter in engagement with the surrounding wall of a drill hole of a first diameter, and to a maximum expanded diameter in engagement with the surrounding wall of a drill hole of a second diameter, the difference between said minimum and maximum diameters being at least ¼".

4,403,895

VEHICLE FLOOR MAT RETAINER

David L. Caldwell, Sunfield, and Edward C. Schelling, Leslie, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1981, Ser. No. 269,345
Int. Cl.³ F16B 5/02, 35/04
U.S. Cl. 411—378 2 Claims



1. A retainer for securing a floor mat to mass backed carpet of the type having a carpet layer and a padding layer and installed on a vehicle floor comprising,

a shank having a length less than the distance between the upper face of the carpet layer and the vehicle floor and including a self-piercing one end to pierce the layers,

a tapered high lead spiral thread on the shank and merging at its apical end into the self-piercing one end of the shank to self-thread the shank through the carpet layer and into the padding layer,

the thread merging at its basal end into a first partial shoulder extending radially of the shank and located between the carpet and padding layer when the shank is self-threaded through the carpet layer and into the padding layer,

a second radial extending shoulder on the shank spaced from the first shoulder a distance less than the thickness of the carpet layer to compress the carpet layer therebetween and recess the second shoulder into the upper face of the carpet layer and locate the self-piercing one end of the shank relative to the vehicle floor and avoid bulging of the carpet, and

a headed portion extending from the second shoulder and receivable in an opening in the floor mat to thereby seat the floor mat on the second shoulder and retain the floor mat against shifting relative to the carpet layer.

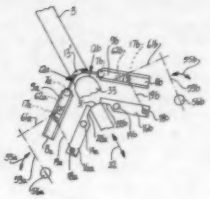
4,403,896

APPARATUS FOR CONVERTING HOLES IN A STACK OF OVERLAPPING LEAVES INTO ARCUATE PASSAGES

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstrucktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Jun. 17, 1980, Ser. No. 160,440
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952183
Int. Cl.³ B42B 5/08
U.S. Cl. 412—38 28 Claims

1. Apparatus for converting elongated open-ended hole which extend transversely of an elongated edge face of a stack of overlapping leaves into arcuate passages each consisting of at least partly registering perforations in the leaves of the stack, comprising means for locating the stack in a predetermined position so that at least a portion of its edge face and the ends of at least some of its holes are accessible; first and second converting means disposed at the opposite sides of the stack in said position and each including at least one mandrel in register with the corresponding end of the hole at the respective side of the stack in said position, means for moving the respective mandrel into and from the registering hole, and means for supporting the respective mandrel for pivotal movement about an axis which is substantially parallel to the edge face of the stack in said position; and means for pivoting said mandrels about the respective axes through the medium of the leaves of the stack in said position, including a shaping member having a convex surface, and means for transporting said surface of said shaping member into engagement with the edge face of the stack in said position while said mandrels extend into the



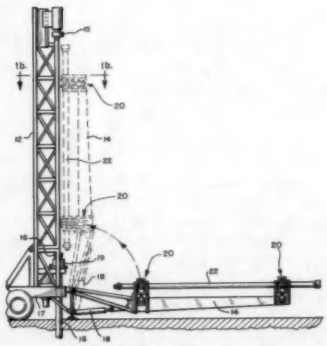
registering holes so that said edge face assumes a concave shape which is complementary to said convex surface as a result of shifting of at least some leaves of the stack in said position whereby the thus shifted leaves pivot said mandrels about the respective axes.

4,403,897

SELF-CENTERING CLAMP FOR DOWN-HOLE TUBULARS

Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Aug. 29, 1980, Ser. No. 182,770
Int. Cl.³ E21B 19/14
U.S. Cl. 414—22 35 Claims



1. A self-centering clamp for clamping down-hole tubulars of various diameters, said clamp comprising:

first and second opposed clamping members;

means for guiding the first and second clamping members along a first line;

first and second opposed beams coupled to the first and second clamping members, respectively, each of said first and second beams having a pivot point;

means for pivotably supporting the first and second beams at the respective pivot points such that a constant separation is maintained between the pivot points;

means for guiding the support means along a second line; and

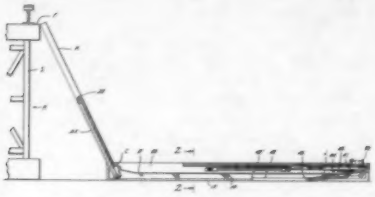
means for pivoting the first and second beams about the respective pivot points to move the first and second clamping members symmetrically along the first line.

4,403,898

PIPE PICK-UP AND LAYDOWN MACHINE

Carroll R. Thompson, 2818 W. 42nd St., Odessa, Tex. 79760

Filed Dec. 31, 1981, Ser. No. 336,250
Int. Cl.³ E21B 19/14
U.S. Cl. 414—22 2 Claims



1. A pipe pick-up and lay-down machine for transporting joints of pipe between positions adjacent a pipe storage rack and a rig floor elevated above the pipe storage rack comprising:

(a) a longitudinally extending base support means adapted to be set in a generally horizontal position for receiving lengths of pipe from adjacent pipe storage racks;

(b) track means secured to the forward end of said longitudinally extending base support means and inclined upwardly and outwardly from the end of said base support means to a position adjacent one side of an elevator floor of a drilling rig;

(c) longitudinally extending trough trestle means having pipe receiving means telescopically mounted therein with means for telescopically extending and retracting said pipe receiving means with respect to said trough trestle means;

(d) a carriage pivotally secured to one end of said trough trestle means with roller means on said carriage for engaging said track means;

(e) hydraulic lift means connected to said carriage for moving said carriage and the forward end of said trough trestle means secured thereto upwardly and downwardly along said inclined track means from a position nested in said base support means to a position adjacent said side of the elevator rig floor;

(f) longitudinally extending rear track means near the end of said base support means opposite two said inclined track means and having stop means at the end of said track means nearest said inclined track means;

(g) articulated leg means having one end pivotally connected to said trough trestle means and the other end received in said longitudinally extending rear track means whereby said articulated leg means is moved along said longitudinally extending track means as the front end of said trough trestle means is elevated along an inclined track means until said articulated leg means is stopped by said stop means and thereafter continued upward movement of said carriage along said inclined track means will cause said articulated leg means to pivot upwardly raising the rear end of said trough trestle.

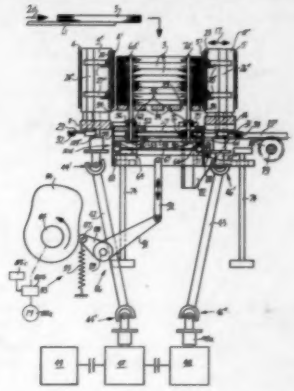
4,403,899

APPARATUS FOR GATHERING WRITING PADS OR THE LIKE

Siegfried Lampe, Ellerbek, and Heinz Lehmann, Hamburg, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Jun. 2, 1981, Ser. No. 269,563
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021124
Int. Cl.³ B65H 31/30
U.S. Cl. 414—35 37 Claims

1. Apparatus for gathering stacks of pads or analogous commodities, comprising a row of neighboring receptacles having a stationary floor; means for feeding commodities into said receptacles so that the receptacles accumulate stacks of commodities; and means for removing the stacks from said receptacles, including first and second conveyor means flanking said row, each of said conveyor means comprising an endless flexible element and upright rotary guide members for such flexible element, each of said flexible elements having an elongated reach adjacent to the respective side of said row, at least a portion of at least one of said conveyor means being shiftable between a first position nearer to the other of said conveyor means to thereby establish motion transmitting contact between the stacks and said conveyor means and a second position distant from said other conveyor means, means for shifting said portion of said one conveyor means between said first and second positions including means for moving said reach of said one conveyor means toward and away from said other conveyor means, said moving means including a reciprocable back support adjacent to that side of the respective reach which faces away from said row, and means for advancing said conveyor means to remove the stacks from said receptacles in the longitudinal direction of said row on movement of said portion of said one conveyor means to said first position.

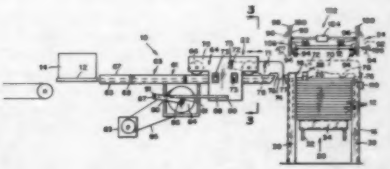


4,403,900

PALLET STORING AND DISTRIBUTING APPARATUS

Paul M. Thomas, Paradise Valley, Ariz., assignor to Builders Equipment Company, Phoenix, Ariz.

Filed Jan. 16, 1981, Ser. No. 225,713
Int. Cl.³ B65G 60/00
U.S. Cl. 414—137 10 Claims



1. An apparatus for storing a plurality of pallets and for distributing pallets one at a time to a work station, comprising:

a vertically oriented magazine having an open top end for holding a plurality of pallets stacked one upon the other;

pallet lift means disposed for movement in the vertical direction to selectively move pallets stored in the magazine in a travel path upwardly to the open top end of said maga-

zine and downwardly away from the open top end of said magazine;

pallet unloading means movable in a horizontal direction disposed adjacent the open top end of the magazine for removing pallets one at a time from the top open end of the magazine;

said pallet unloading means including:

opposed pallet support means extending generally parallel to the plane of the pallets in the magazine; and;

reciprocating means for sliding the top pallet from the magazine onto said pallet support means;

pallet loading means disposed above the open top end of the magazine for selectively loading pallets downwardly into the magazine through its open top end; and,

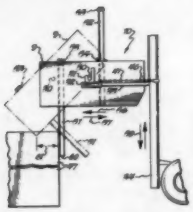
means disposed outside of the travel path of the pallets for sensing the position of the uppermost pallet relative to said pallet unloading means, and means operatively connecting said sensing means to said pallet lift means to raise said pallet lift means when the uppermost pallet is positioned below a predetermined low level and to lower said pallet lift means when the uppermost pallet is positioned above a predetermined high level to thereby maintain the uppermost pallet in position to slide onto said opposed pallet support means.

4,403,901

DUMP BIN

John F. Kopczynski, 1671 Sweeney St., North Tonawanda, N.Y. 14120

Filed Oct. 6, 1980, Ser. No. 194,612
Int. Cl.³ B65G *65/23*; B66F *9/19*
U.S. Cl. 414—422 **17 Claims**



1. A dump bin comprising a housing including a floor and a plurality of sides extending upwardly from said floor, pivot means on said housing for permitting said housing to tip, bearing means for pivotally mounting said pivot means, means for receiving a device for lifting said bin, retractable-extensible means, and mounting means for mounting said retractable-extensible means relative to said housing for retaining said retractable-extensible means in a retracted higher position with respect to said floor when said bin is located on a supporting surface which engages a bottom portion of the bin and for permitting said retractable-extensible means to be moved by gravity to assume an extended position at a lower elevation with respect to said floor in response to lifting of said bin for dumping and for permitting movement of said retractable-extensible means to a retracted position aganst the force of gravity upon engagement of said retractable-extensible means with said supporting surface as said housing is being lowered, said retractable-extensible means in said extended position causing said housing to pivot about said pivot means as said bin is moved toward an external member after said retractable-extensible means has abutted said external member.

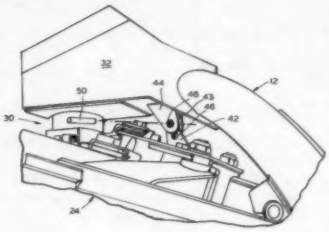
17. A dump bin comprising a housing including a floor and a plurality of sides extending upwardly from said floor, pivot means on said housing for permitting said housing to tip, bearing means for pivotally mounting said pivot means, means for receiving a device for lifting said bin, an elongated rod, means pivotally mounting said elongated rod on said housing for pivotal movement to a position wherein a portion of said elongated rod pivots to a predetermined lower elevation relative to said floor after said bin has been lifted by said device for lifting said bin than the elevation which said elongated rod occupies when said bin is resting on a supporting surface, and means on said housing for limiting pivotal movement of said elongated rod when said portion of said elongated rod has reached said predetermined lower elevation.

4,403,902

MEANS FOR CONVERTING A GRAPPLE SKIDDER TO A CABLE SKIDDER

Ronald Sapelak, Belmont, Canada, assignor to Clark Equipment Company, Buchanan, Mich.

Filed Jan. 26, 1982, Ser. No. 342,862
Int. Cl.³ B66B *1/42*
U.S. Cl. 414—569 **7 Claims**



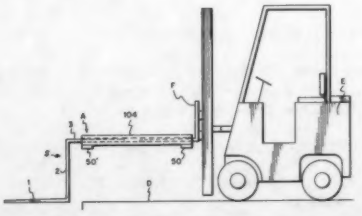
1. An improved grapple boom assembly for a skidder vehicle adaptable from a grapple skidder configuration to a cable skidder configuration wherein the grapple boom assembly comprises a boom having a relatively narrow support base mounted on the rear of the frame of the skidder vehicle, the support base having grapple mounting means at its upper end for a grapple mechanism mounted thereon, the grapple mechanism having grapple arms associated therewith, the grapple mechanism being pivotable on the grapple mounting means so that a side portion of the grapple mechanism may engage a lower portion of the mounting means to effect a solid connection therebetween to retain the grapple mechanism in a relatively parallel configuration with the grapple mounting means, and the juxtaposition of the grapple mechanism and the boom permitting the skidder vehicle to operate in a cable skidder configuration.

4,403,903

EXTENSION MEMBER FOR SURROGATE FORKS FOR A FORK LIFT TRUCK

Arthur P. Cary, P.O. Drawer AC, Hutchins, Tex. 75141

Continuation-in-part of Ser. No. 962,552, Nov. 20, 1978, Pat. No. 4,290,729. This application Sep. 21, 1981, Ser. No. 303,727
Int. Cl.³ B66F *9/12*
U.S. Cl. 414—607 **7 Claims**



1. In a fork lift truck having forwardly extending forks,

a. surrogate fork members comprising an upper horizontal portion, a vertically extending central portion, and a lower surrogate fork portion, operatively positioned ahead of said forks,

b. said surrogate fork portions of said surrogate fork members extending forward and substantially parallel to said truck forks,

c. an extension member intermediate said truck forks and said surrogate fork members and joining them in operative relationship,

d. said extension members comprising channels overlying portions of said truck forks and portions of said upper horizontal portions of said surrogate fork members,

e. forward and rearward straps of a width shorter than their length attached to and extending across the underside of said channels near the ends thereof, wherein the rearward straps underlie said forks and the forward straps underlie said upper horizontal portion of said surrogate fork members.

4,403,904

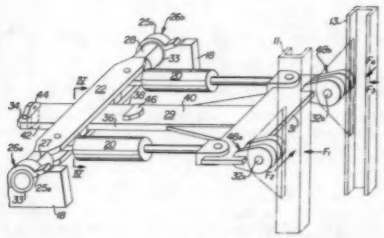
LIFT TRUCK GUIDE ASSEMBLY

Charles R. Chelin, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 142,300, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 787,818, Apr. 15, 1977, abandoned. This application Jun. 18, 1981, Ser. No. 274,937

Int. Cl.³ B65G *1/00, 65/00*

U.S. Cl. 414—634 **11 Claims**



1. In a material handling device having a frame, a mast assembly having a bottom end, first and second spaced upright members and a vertically movable material handling means mounted on said first and second spaced upright members, and connection means pivotally mounting said mast assembly adjacent the bottom end to said frame; the improvement comprising:

a guide bar having a pair of ends;

spaced support means pivotally mounting said pair of ends to said frame at a location spaced from said connection means;

an elongated movable guide tongue having a first end;

means pivotally mounting the first end of said tongue to said upright members at a location spaced from said connection means;

extensible power means for pivoting said mast assembly about said connection means, said extensible power means having first and second ends;

pivot means for mounting the first end of said power means to said first end of said tongue;

further pivot means for connecting the second end of said power means to said guide bar;

slide means for slidably receiving a portion of said guide tongue, said slide means being mounted on said guide tongue and operative to restrict movement of said power means and guide tongue in a substantially linear direction along their respective longitudinal dimension while pivoting said mast assembly about said connection means.

4,403,905

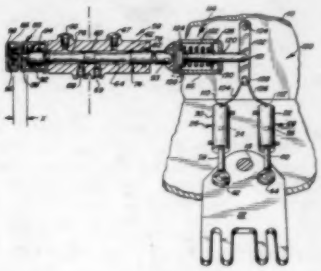
OPERATING MECHANISM FOR A SWING MECHANISM VALVE

Herman J. Maurer, and Carl O. Pedersen, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Continuation-in-part of Ser. No. 180,311, Aug. 22, 1980, Pat. No. 4,341,501. This application Sep. 8, 1981, Ser. No. 300,183

Int. Cl.³ E02F *3/32*

U.S. Cl. 414—695.5 **6 Claims**



1. An improved hydraulic swing mechanism for a material handling implement having a frame, a swing tower pivotally supported by said frame for rotation about a vertical axis through an arc, and a boom supported by said swing tower, comprising:

first and second hydraulic motors each having one end pivotally connected to said frame and another end pivotally connected to said swing tower, each motor being extensible whereby extension and contraction of said motors pivot said swing tower relative to said frame,

control valve means operable by the implement operator to selectively supply pressurized hydraulic fluid in said first and second hydraulic motors for selectively rotating said swing tower relative to said frame,

sequencing valve means in fluid communication with said control valve means and said first and second hydraulic motors for selectively re-routing pressurized hydraulic fluid supplied from said control valve means to said first and second hydraulic motors, said sequencing valve means having a plurality of operating positions, and

valve operating means including an arm means pivotally connected to said frame and connected with each of said first and second hydraulic motors for pivotal movement of said arm means in response to pivoting of said motors with respect to said frame, and further including first and second flexible linkage means respectively connecting said arm means with said first and second hydraulic motor means whereby tensioning of one of said first and second flexible linkage means by pivoting movement of its respective hydraulic motor pivots said arm means, and

linkage means connecting said arm means to said sequencing valve means for selectively repositioning said sequencing valve means by pivotal movement of said arm means.

4,403,906

MATERIAL HANDLING APPARATUS

Vaino J. Holopainen, P.O. Box 806, Center Harbor, N.H. 03226

Filed Nov. 12, 1981, Ser. No. 320,462

Int. Cl.³ B66C *23/54*

U.S. Cl. 414—724 **7 Claims**

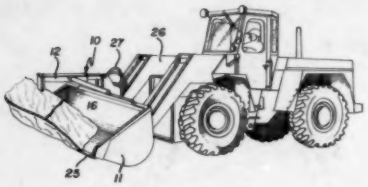
1. Material handling apparatus for use on a pivoted bucket, comprising:

(a) a bracket mounted on an upper edge of the bucket,

(b) a clamp arm mounted on the bucket for pivotal movement about one end, the clamp arm consisting of two

telescoping parts, one of said parts being pivotally connected at a first point to said bracket,

(c) a first hydraulic actuator located in the arm to produce telescoping movement between the parts, and



(d) a rigid non-extendable link pivotally connected at one end to the other of said parts and pivotally connected at its opposite end to the bracket at a second point which is spaced from said first point.

4,403,907

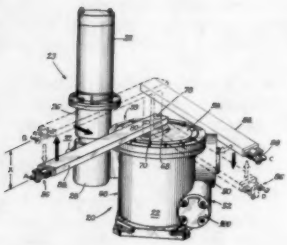
CAM-DRIVEN ROTARY PICK-AND-PLACE ASSEMBLY APPARATUS

Frank H. Koller, Norridge; Jeffrey P. Peterson, Evanston, both of Ill., and Robert E. Snizek, Colorado Springs, Colo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 18, 1981, Ser. No. 293,996

Int. Cl.³ B23Q *7/04*; B65G *47/90*

U.S. Cl. 414—744 R **7 Claims**



7. A rotary, pick-and-place assembly apparatus of the type including a housing; a constant-speed input shaft which carries a rotary cam and a lift cam; a follower wheel assembly rotatably-journaled on the housing and drivably-engaged with the rotary cam, the follower wheel assembly including a follower wheel and a pair of parallel guide shafts which are connected at their respective lower ends and which are slidably-received within bores formed in the follower wheel, whereby rotation of the rotary cam affects timed rotary oscillation of the follower wheel and the guide shafts along one direction; a lift shaft assembly rotatably-journaled on the housing and drivably-engaged with the lift cam, the lift shaft assembly including a radially-extending lift shaft clevis, whereby rotation of the lift cam affects timed oscillation of the lift shaft clevis along another direction which is generally normal to the one direction, the improvement comprising:

a toggle linkage assembly rotatably and pivotally connecting the guide shafts to the lift shaft clevis,

said toggle linkage assembly comprising bearing plate means and pivot clevis means,

said bearing plate means characterized as being rotatably movable with the guide shafts and pivotally connected to said pivot clevis means,

said pivot clevis means characterized as being pivotally mounted to the lift shaft clevis,

whereby said toggle linkage assembly transfers linear oscillation to the guide shafts when the lift shaft clevis is oscillated along the other direction, while permitting rotation of said guide shafts with and when the follower wheel assembly is oscillated along the one direction.

4,403,908

METHOD FOR THE EMPTYING OF CIGARETTE TRAYS INTO MAGAZINES

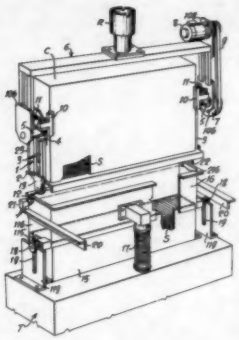
Italiano Cartoceti, Bologna, Italy, assignor to CIR S.p.A. Divisione Sasib, Bologna, Italy

Filed Jul. 23, 1980, Ser. No. 171,424

Claims priority, application Italy, Jul. 31, 1979, 12699 A/79

Int. Cl.³ B65G *65/24*

U.S. Cl. 414—786 **1 Claim**



1. A method for the emptying of trays filled with rod-like articles into hoppers, each tray presenting at least one discharge side for the discharge of the articles, characterized by the following steps:

(a) positioning a full tray, with the discharge side closed and directed downwardly, over the hopper;

(b) lowering said full tray until it reaches a lowered position at which the closed discharge side is substantially at the level of the articles already contained in the hopper;

(c) fully opening the discharge side of said full tray while maintaining said full tray at said lowered position; and

(d) raising the tray to its initial position.

4,403,909

METHOD FOR DISCHARGING CATALYST PARTICLES FROM A MOVING BED SYSTEM AT A SUBSTANTIALLY STEADY FLOW RATE

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 132,970, Mar. 24, 1980, Pat. No. 4,308,238. This application Aug. 3, 1981, Ser. No. 289,575

Int. Cl.³ B01J *23/90*, *4/00*; B65G *00/00*

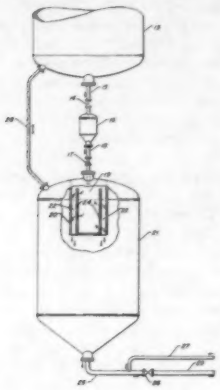
U.S. Cl. 414—786 **4 Claims**

1. A method for the discharge of a periodic flow of a measured volume of catalyst particles in a moving bed catalyst system into a catalyst hopper, wherein said particles pass through a flow dampener vessel contained within said catalyst hopper, said dampener vessel comprising a cylindrical vessel having side walls possessing a pair of chordal formed catalyst passageways defined by a pair of spaced apart chordal baffles and said side walls of said vessel and a bottom outlet means below said passageways, said pair of spaced apart chordal baffles having a plurality of horizontally opposed and vertically spaced apart outlet means, said baffles being disposed on opposite sides of a plane containing the central axis of said vessel and being parallel thereto, and both connected with a horizontal plate, the space between said chordal baffles defining a central hold-up chamber above said horizontal plate; which method comprises:

(a) withdrawing said catalyst particles periodically from said moving bed system;

(b) introducing said particles into said hold-up chamber defined within said flow dampener vessel by said chordal baffles and interconnecting horizontal plate;

(c) withdrawing catalyst particles through said plurality of horizontally opposed and vertically spaced apart outlet



means into said catalyst passageways; wherein said withdrawal rate in any horizontal plane is controlled to equal up to about 50% of the average rate at which said particles are introduced to said catalyst particles hold-up chamber; and

(d) passing said catalyst particles in said catalyst passageways downward through said bottom outlet means and into said catalyst hopper.

4,403,910

PUMP APPARATUS

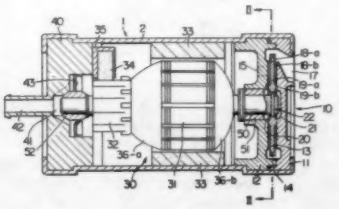
Kiyohiko Watanabe, Chiryu; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Kariya; Toshiaki Nakamura, Anjo, and Shusaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 27, 1982, Ser. No. 372,377

Claims priority, application Japan, Apr. 30, 1981, 56-63071[U]

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—53 T **1 Claim**



1. A pump apparatus comprising:

a regenerative pump means,

means operatively connected to said pump means for driving said pump means,

said pump means including a pump housing and a closed vane type impeller rotatably housed in said pump housing,

said pump housing cooperating with said impeller to define a substantial circumferential fluid passage surrounding outer peripheral portion of said impeller,

said pump housing provided therein with suction and discharge ports circumferentially spaced from each other and communicated with said circumferential fluid passage,

means disposed in said circumferential fluid passage between said suction and discharge ports to provide a circumferential seal therebetween,

said impeller having a substantially disc-like shape and provided with circumferential rows of radial vane grooves in side faces of said impeller adjacent to the outer peripheral surface thereof,

each of said circumferential rows comprising first vane grooves each of which has a depth at the outer peripheral surface equal to or greater than a half of the impeller thickness and second vane grooves each of which has a depth at the outer peripheral surface less than a half of the impeller thickness,

said first vane groove circumferentially alternating with said second vane groove in each of said rows and axially aligning with said second vane groove.

4,403,911

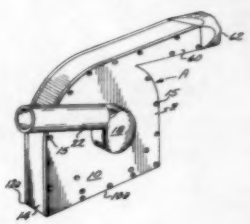
BLADELESS PUMP AND METHOD OF USING SAME

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110

Continuation of Ser. No. 858,654, Dec. 8, 1977, abandoned. This application May 27, 1980, Ser. No. 152,998

Int. Cl.³ F01D *1/36*

U.S. Cl. 415—90 **9 Claims**



1. A pump for use in transferring either a single phase or multiphase fluid from a first location to a second location which includes:

a. a housing assembly that includes first and second vertically disposed, laterally spaced first and second side walls and a continuous end wall that extends transversely therebetween to cooperate therewith to define a circular confined space, a centrally disposed first opening in said first side wall in communication with said first location, a discharge opening in said end wall that is at a higher elevation than said first opening and is in communication with said second location, and a second opening in said second side wall that is oppositely disposed from said first opening, said housing assembly formed from a rigid material resistant to action by said fluid;

b. a rotatable drive shaft that has first and second ends;

c. bearing and seal means supported in a fixed relationship from said second side wall and coaxially aligned with said second opening therein, said bearing and seal means rotatably supporting said drive shaft, with said first end of the latter disposed within said confined space and adjacent the latter;

d. a substantially smooth first circular disc in said confined space secured to said first end of said drive shaft and intermediately positioned between said first and second side walls with said second end of drive shaft when rotated at greater than a first rate causing a circular body of said fluid in said confined space to rotate due to a rotary force exerted on said body of fluid as a boundary layer of

said fluid on the exterior surface of said first circular disc is rotated relative to said body of water to be sheared therefrom, and said fluid entering said confined space through said first opening having increasing rotary velocity imparted thereto to sequentially move outwardly in a spiral path due to the centrifugal force imposed thereon and be sequentially ejected from said discharge opening to flow to said second location said first side wall and end wall at their junction defining a circumferentially extending recess that is in communication with said confined space; and

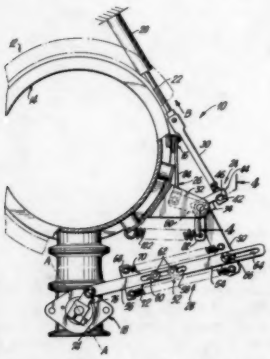
e. a first ring-shaped side plate rotatably supported in said confined space adjacent said first side wall, and said first side plate having the outer peripheral edge portion thereof rotatably supported in said recess, said first side plate including a centered opening axially aligned with said first opening in said first side wall, with said first side plate free to rotate with said circular body of liquid to minimize the frictional drag on said circular body of fluid as said circular body rotates relative to said housing.

4,403,912

INTEGRATED MULTIPLANE ACTUATOR SYSTEM FOR COMPRESSOR VARIABLE VANES AND AIR BLEED VALVE

Frederick J. Pekari, Trunbull, and Robert E. Johnson, Stepney, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Mar. 23, 1981, Ser. No. 246,657
Int. Cl.³ F01B *25/02*; F01D *17/00*
U.S. Cl. 415—150 **1 Claim**



1. An integrated multiplane actuator mechanism for sequentially controlling the bleed control valve and variable guide vanes of a generally horizontally extending compressor of a gas turbine engine comprising:

a first actuating linkage operatively connected to said bleed control valve, said bleed control valve being disposed adjacent the bottom portion of the compressor;

a single actuating means disposed adjacent the top portion of the compressor;

a second actuating linkage operatively connected to said variable guide vanes, said second actuating linkage being adjacent a side portion of the compressor;

intermediate crank means secured to the casing of the compressor and operatively connected to said first and second actuating linkages and to said actuating means, said intermediate crank means including a shaft secured to and extending in spaced, parallel relationship to the longitudinal axis of the compressor casing, a pair of crank cylinders rotatably mounted on said shaft, with the first of said crank cylinders being connected to said actuating means and to said first actuating linkage, said first crank cylinder being operatively connected for pivotal movement upon actuation of the single actuating means, said first crank cylinder including a connecting pin secured thereto and displaced radially outward therefrom, said pin extending generally parallel to the axis of the first crank cylinder into the vicinity of the second crank cylinder, the second of said crank cylinders including a connecting flange secured thereto and extending radially outward therefrom to intermittently engage the connecting pin;

said first crank cylinder further comprising a crank arm;

said first actuating linkage further comprising an adjustable link, one end of which includes an elongated slot therein, with said crank arm being connected to said adjustable link by a pin connection extending through and slidably mounted in said elongated slot thereby providing lost motion between said first crank cylinder and said first actuating linkage during sequential operation of the second actuating linkage, said crank arm of the first crank cylinder being connected to the first actuating linkage to transmit forces substantially within a first plane extending transverse to the axis of the gas turbine engine;

said second crank cylinder further comprising a crank arm;

said second actuating linkage being connected to the crank arm of the second crank cylinder to provide a transmission of forces substantially within a second plane extending parallel to said first plane; and

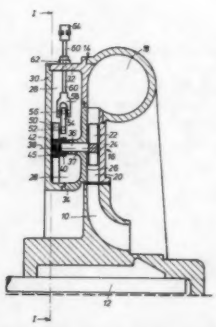
said crank arms and said connecting flange being relatively positioned on the first and second crank cylinders to provide a sequential actuation of the first actuating linkage, and then the second actuating linkage during a full movement of the actuating means.

4,403,913

GUIDE BLADE ARRANGEMENT FOR ADJUSTABLE GUIDE BLADES

Jens E. Fisker, Snekkersten, Denmark, assignor to Helsingoer Vaerft A/S, Elsinore, Denmark

Filed Nov. 3, 1981, Ser. No. 317,843
Int. Cl.³ F04D *27/00*
U.S. Cl. 415—150 **3 Claims**



1. A guide blade arrangement for devices for flowing media for use in connection with controlling a stream of fluid and having an annular passage, limited by an outer wall and an inner wall, a ring of angularly adjustable guide blades being arranged within said passage, said inner wall further limiting on the side thereof opposite to said passage a control chamber further limited by an annular inner wall and an annular outer wall as well as by a back wall, each said guide blade being provided with a supporting pin that is rotatably mounted in said inner wall extending through the inner wall into said control chamber, said supporting pins having mutually substantially parallel axes extending along an annular curvature line, and each said supporting pin being provided within said control chamber with an arm having a free end that is pivotably connected to a control member common to all said arms by

means of a stud having an axis that is substantially parallel to said supporting pin axes, wherein:

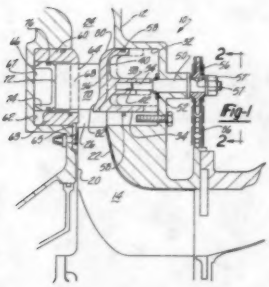
all said arms being mutually substantially parallel and having the same length measured as the distance between the axes of the corresponding one of said supporting pins and the corresponding one of said studs, and that said control member is constituted by a control ring that by means of said studs is carried by said arms, and which control ring is connected to an adjusting member adapted to provide a translatory displacement of said control ring and a first center point common to said annular curvature line and to said annular passage, and said control ring having a second center point being eccentric with respect to the first center point.

4,403,914

VARIABLE GEOMETRY DEVICE FOR TURBOMACHINERY

Casimir Rogo, Mt. Clements; Herman N. Lenz, and Michael Holbrook, both of Lambertville, all of Mich., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 13, 1981, Ser. No. 282,524
Int. Cl.³ F04D 27/00
U.S. Cl. 415—165 **11 Claims**



1. A variable geometry device for a turbine engine comprising:

a support housing,

said support housing having a pair of substantially radially extending spaced walls forming a radial flow passageway therebetween,

a first recessed channel formed along one of said support housing walls,

a second recessed channel formed along the other support housing wall, said channels facing and in registration with each other,

a first ring mounted in said first channel and a second ring mounted in said second channel,

a plurality of spaced vanes secured to and extending between said rings,

means for moving said first ring transversely across said passageway between a retracted position in which said first ring is nested within said first channel and an extended position in which said first ring protrudes into and restricts said passageway; and

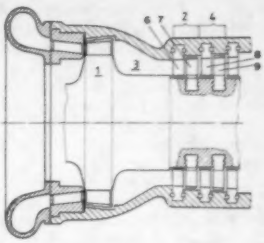
wherein the restriction of the passageway is substantially proportional to the transverse position of said first ring and wherein said first ring has one face which face is contoured by meridional constriction to reduce turbulence and secondary losses of fluid flow through the passageway.

4,403,915

EXCESS PRESSURE TURBINE WITH A CONSTANT PRESSURE REGULATION STAGE

Arnulf Teufelberger, Gebenstorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Dec. 15, 1980, Ser. No. 216,829
Claims priority, application Switzerland, Feb. 1, 1980, 823/80
Int. Cl.³ F01D 1/04
U.S. Cl. 415—199.5 **4 Claims**



1. In an excess pressure steam turbine containing a constant pressure regulation stage which is arranged forwardly of the reaction blading of the turbine and contains a regulation impeller and a rim of nozzles which throttles in sectors, the improvement which comprises:

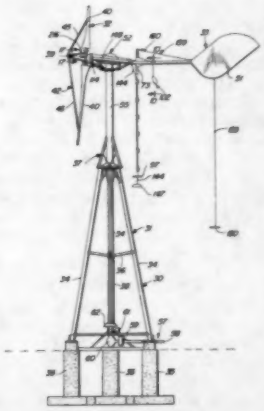
first stages following the impeller of the reaction blading, following the impellar wheel being structured so as to have stepwise increasing intermediate degrees of reaction, the value of which is between 0 and 0.5.

4,403,916

WIND TURBINES

David A. Skelskey, Chicago, Ill., assignor to Chicago Province of the Society of Jesus, Chicago, Ill.

Filed Sep. 2, 1980, Ser. No. 183,077
Int. Cl.³ F03D 7/04
U.S. Cl. 416—14 **38 Claims**



1. A wind turbine comprising:

(a) a vertically extending supporting tower having

(1) an upper end portion;

(b) a vertically extending power delivery shaft mounted on the said vertically extending supporting tower structure;

(c) a front and blade section including

(1) a generally horizontally extending tubular supporting

structure mounted on the said upper end portion of the said vertically extending supporting tower structure;

(2) a supporting bearing hub mounting assembly mounted on the said horizontally extending tubular supporting structure;

(3) a first and generally horizontally extending rotatable blade driven power shaft rotatably mounted within the said generally horizontally extending tubular supporting structure on the said hub mounting assembly and having a generally horizontally extending axis;

(4) a plurality of radially arranged wind-driven blade members mounted on the said hub mounting assembly and operatively connected to the said blade driven power shaft;

(5) means for coupling the said wind-driven blade members to the said first and generally horizontally extending rotatable blade-driven power shaft;

(6) power transmission means for transmitting rotating motion of the said first and generally horizontally extending rotatable blade-driven power shaft, under the force of wind applied against the said blade members, to the said vertically extending power shaft;

(d) a rear or tail section including

(1) a second generally horizontally extending tubular supporting structure;

(2) a second and generally horizontally extending tail-supporting shaft having a generally horizontally extending longitudinal axis and including

a. a front end portion; and

b. a rear end portion;

(3) means for rotatably mounting the said second and tail-supporting shaft within the said second and generally horizontally extending tubular supporting structure;

(4) a tail or tail fin member mounted on the said rear end portion of the said second and generally horizontally extending tail-supporting shaft and rotatable therewith;

(e) means for interconnecting the said front and blade section and the rear and tail section in a generally parallel and coplanar relationship;

(f) pivotal mounting means for pivotally mounting the said interconnecting means and the said front and blade section and the said rear and tail section for pivotal movement in a generally horizontal plane on the said pivotal mounting means for movement of the said rear or tail section out of the said generally parallel and coplanar position into a position at an angle of approximately ninety degrees (90°) relative to the said front or blade section; and

(g) manually operable latching means coacting with the said interconnecting means and with the said pivotal mounting means for selectively latching the said rear or tail section in a normal position parallel to the longitudinal axis of the said first and blade-driven power shaft or in a position extending generally rightangularly relative to the longitudinal axis of the said first and blade-driven power shaft.

4,403,917

TURBINE DISTRIBUTOR VANE

Denis R. G. Laffitte, Miramas; Guy H. Louis, Chartrettes, and Alain M. M. Raybaud, Verneuil l'Etang, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Jan. 5, 1981, Ser. No. 222,624

Claims priority, application France, Jan. 10, 1980, 80 00458

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—96 A **7 Claims**

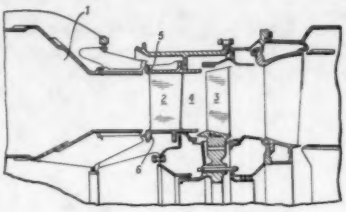
1. A turbine nozzle vane having at least one inner hollow chamber formed therein comprising:

a corrugated Y-shaped sleeve positioned against opposite sides of said hollow chamber;

a first and second radial rib extending from each of said opposite sides of said chamber;

a first and second row of protruding elements extending from each of said opposite sides;

longitudinal lock means disposed in said chamber for positioning said sleeve against said protruding elements and for elastically pressing end portions of said sleeve against said radial ribs, said first and second rows of protruding elements forming a zone of said elements extending from each of said opposite sides throughout most of the height



of each of said opposite sides of the vane, the width of the zone of said elements being maximal at a base portion of said zone and changing gradually along the entire height of said zone so as to become minimal at an upper portion thereof, said vane having an opening formed therein through which cooling fluid enters and which is located on a side of said opposite sides where the width of said zone of elements is minimal.

4,403,918

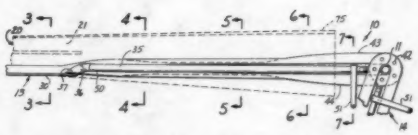
HUBLESS, HINGELESS AND BEARINGLESS HELICOPTER ROTOR SYSTEM

Buford J. Schramm, 1330 E. Fremont Dr., Tempe, Ariz. 85204

Filed Jan. 19, 1982, Ser. No. 340,774

Int. Cl.³ B64C *27/38*

U.S. Cl. 416—138 **10 Claims**



1. A helicopter rotor system comprising:

a rotary mast having an upright axis;

a plurality of rotor blades mounted to said rotary mast to be turned by said mast, each said blade having a respective longitudinal axis directed away from said mast, all of said rotor blades being substantially identical to one another, and being angularly spaced apart around said mast, each said blade comprising a skin forming an airfoil and an internal region, a counterweight rod and a spar extending longitudinally inside said region, said spar comprising a bundle of aligned fibers which, inside said region are bonded to each other, to said skin, and to said counterweight rod, said bundle being doubled so as to form a U-shaped bight portion with a bend and a pair of arms disposed inboard of said skin, said fibers inside said region constituting continuations of the fibers in said arms;

a longitudinally-extending torque tube rigidly attached to said counterweight rod at a first end of said torque tube, and a first bearing member adjacent to the other end of said torque tube, said torque tube having an axis;

a second bearing member mounted to said mast and engaged to said first bearing member, whereby said torque tube is rotatable around its own axis, and can move in any angular direction away from said longitudinal axis around the

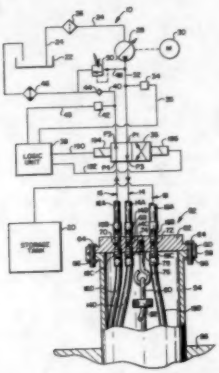
center of said second bearing means, whereby to enable lead/lag and flapping movements;
the bight portion being progressively shaped from a flat portion bent directly around said mast, through a pair of separate channel sections, to a bundle adjacent to said counterweight rod;
pitch horn means attached to said torque tube to rotate said torque around the axis of said torque tube;
attachment means attaching said flat portions of said bight portion in a stack to transfer centrifugal loads to said mast; and
said bight portion being bendable adjacent to said mast.

4,403,919

APPARATUS AND METHOD FOR PUMPING A LIQUID FROM A WELL

George E. Stanton, Orient, and Patrick A. McFadden, Columbus, both of Ohio, assignors to Njuack Oil Pump Corporation, Columbus, Ohio

Filed Sep. 30, 1981, Ser. No. 306,953
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—53 **25 Claims**



1. A method of pumping a liquid from a well, comprising:
providing a drive unit adjacent said well;
disposing a pump unit adjacent the bottom of said well such that said pump unit is at least partially immersed in the liquid in said well;
interconnecting said drive unit and said pump unit by first and second supply lines;
providing a liquid discharge line extending from said pump unit to adjacent the upper end of said well and through which liquid pumped by said pump unit can leave said well,
said drive unit comprising:
a pump for hydraulic fluid;
a high-pressure line connected to the outlet of said pump;
a return line for hydraulic fluid;
means for measuring at least one fluid flow parameter selected from the group consisting of pressure and flow rate in said return line and for generating a signal representative of said parameter;
a changeover valve having walls defining a first port connected to said high-pressure line, a second port connected to said first supply line, a third port connected to said second supply line and a fourth port connected to said return line, said changeover valve having a first position wherein it connects its first port to its second port and its third port to its fourth port, thereby connecting said high-pressure line to said first supply line and said second supply line to said return line, and a second position wherein it connects its first port to its third port and its second port to its fourth port, thereby connecting said high-pressure line to said second supply line and said first supply line to said return line; and
a logic unit for receiving said signal and for holding said changeover valve alternately in said first position for a first predetermined period and in said second position for a second predetermined period; and
said pump unit comprising:
a drive cylinder having walls defining first and second ports adjacent opposed ends of said drive cylinder, said first and second ports being connected to said first and second supply lines;
a drive piston slideable within said drive cylinder;
a driven cylinder;
a driven piston slideable within said driven cylinder and connected to said drive piston for movement therewith; and
inlet/outlet means allowing flow of said liquid from said well into said driven cylinder but not in the opposed direction and flow of said liquid from said driven cylinder into to said liquid discharge line but not in the opposed direction;
activating said pump, thereby raising the pressure in said high-pressure line;
retaining said changeover valve in one of its said positions until said signal changes substantially;
shifting said changeover valve to the other of its said positions and determining by means of said logic unit a first interval between said shifting of said changeover valve to said other position and a substantial change in said signal;
shifting said changeover valve back to said one of its said positions and determining by means of said logic unit a second interval between said shifting of said changeover valve back to its said one position and a substantial change in said signal;
calculating in said logic unit a first predetermined period equal to a predetermined multiple of said first interval;
calculating in said logic unit a second predetermined period equal to substantially the same multiple of said second interval;
permitting said logic unit to control the operation of said changeover valve to complete repeated pumping cycles, each said pumping cycle comprising one of said first predetermined periods wherein said logic unit holds said changeover valve in one of its said positions and one of said second predetermined periods wherein said logic unit holds said changeover valve in the other of its said positions.

4,403,920

DEVICE FOR REGULATING THE OUTPUT QUANTITY OF A COMPRESSED MEDIUM

Heinz Lantermann, Bottrop-Kirchhellen, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 267,907
Int. Cl.³ F04C *29/10*
U.S. Cl. 417—295 **2 Claims**

1. In a device for regulating the output quantity of a gaseous medium from a compressor system having at least one compressor with a suction for receiving the gaseous medium and a discharge for discharging compressed gaseous medium, the device having:
a flow control valve in the suction for throttling the flow of the gaseous medium to the compressor system;
a control piston connected to the flow control valve for actuating the throttling of the flow;
a cylinder;
the control piston having a piston part disposed within the cylinder defining a first and second chamber on opposite sides thereof;
a blowdown valve having a passage connected to the discharge and to atmosphere and valve seat means adjacent the passage;

valve means connected to the control piston and movable in the passage between a position in which the valve means engages said valve seat means for closing the passage and a position in which the valve means disengages from the valve seat means for opening the passage;

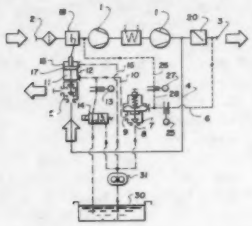
a reservoir for holding a liquid;

pump means for pressurizing and pumping at least part of the liquid from the reservoir;

conduit means connected between the pump means and the cylinder to provide a constant fluid pressure to the first chamber;

a pressure regulator connected between the pump means and the cylinder for passing the pressurized liquid from the pump means to the second chamber responsive to the gaseous pressure in the discharge, the pressure regulator being connected to the discharge;

a liquid throttle means between the pressure regulator and



the control piston for delivering liquid to the reservoir; and

the control piston being operable to open and close the passage of the blowdown valve and to actuate the flow control value responsive to the fluid pressure in the first and second chamber, in combination therewith, the improvement comprising;

a first measuring pipe (6) connected to the discharge;

a second measuring pipe (26) connected to the suction downstream of the flow control valve;

a balancing pipe (28) interconnecting said first measuring pipe and said second measuring pipe;

two throttle valves (25,27) in said balancing pipe; and

the pressure regulator (7) being connected to said balancing pipe intermediate said throttle valves for operation responsive to an intermediate pressure established in said balancing pipe as a function of the throttle cross section of said throttle valves.

4,403,921

MULTI-CYLINDER VARIABLE DELIVERY COMPRESSOR

Kimio Kato; Hiroya Kono, and Hisao Kobayashi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Oct. 21, 1981, Ser. No. 313,681

Claims priority, application Japan, Oct. 27, 1980, 55-151298; Dec. 10, 1980, 55-175027; Dec. 13, 1980, 55-176256

Int. Cl.³ F04B *49/08, 1/16, 1/18*

U.S. Cl. 417—296 **8 Claims**

1. A multi-cylinder compressor adapted for use in compressing a refrigerant gas of a cooling circuit comprising:

cylinder block means having therein a plurality of compression chambers;

housing means having therein a first and a second delivery chamber into which the refrigerant gas is delivered from said compression chambers, and at least a suction chamber from which the refrigerant gas is sucked into said compression chambers;

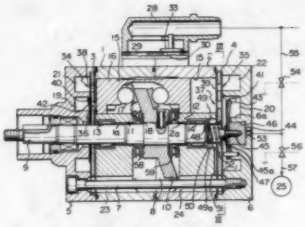
valve plate means arranged between said cylinder block means and said housing means, said valve plate means having therein suction ports providing a fluid communication between said compression chambers and said suction chamber, and delivery ports providing a fluid communication between said compression chambers and said first and second delivery chambers;

a suction means for introducing the refrigerant gas from said cooling circuit into said suction chamber;

a delivery means for delivering the refrigerant gas from said first and second delivery chambers to said cooling circuit;

first delivery valve means closing said delivery ports that provide a fluid communication between said compression chambers and said first delivery chamber, said first delivery valve means being opened by said refrigerant gas delivered from said compression chambers into said first delivery chamber;

second delivery valve means capable of moving between a first position for closing said delivery ports that provide a fluid communication between said compression chambers



and said second delivery chamber and a second position for opening said delivery ports that provide a fluid communication between said compression chambers and said second delivery chamber;

means for urging said second delivery valve means from said first position toward said second position;

a pressure inlet means for applying to said second delivery valve means either a high delivery pressure to move said second delivery valve means from said second position to said first position against said urging means, or a low suction pressure, permitting said second delivery valve means to be moved from said first position to said second position by said urging means, and;

valve means arranged between said second delivery chamber and said delivery means, said valve means being opened when said second delivery valve means is moved from said second position to said first position.

4,403,922

SEAL GLAND IMPROVEMENTS FOR HYDRAULICALLY ACTUATED DOWNHOLE PUMPS

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Sep. 29, 1980, Ser. No. 191,673

Int. Cl.³ F16J *15/48*

U.S. Cl. 417—358 **8 Claims**

1. In a free-type downhole hydraulically actuated pump apparatus which is sealingly received within a collar located downhole in a borehole, a packer nose assembly located at the upper end of a housing of the pump apparatus, the combination with said pump apparatus and collar of a seal assembly which seals the annular area between the pump housing and the collar comprising:

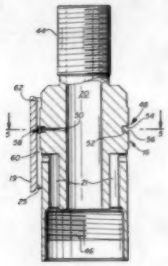
a connector body affixed to the pump housing and having a outer surface which is telescopingly received within the collar, a longitudinal extending passageway formed through the interior of said connector body through which power fluid can flow to an engine of the pump apparatus;

said connector body includes fastener means at each extremity thereof, one fastener means is adapted to be connected

to the upper end of the pump apparatus, the other fastener means is adapted to be connected to the packer nose assembly, said packer nose assembly has an axial passageway which is in communication with the passageway of the connector body at one end thereof and which has an opposed end opened for flow of power fluid thereinto;

a circumferentially extending outwardly opening seal receiving groove formed 360° about said connector body, said groove includes a bottom and opposed sidewalls, means forming a flow port from said longitudinally extending passageway to said groove to provide power fluid pressure at the bottom of said groove;

an annular resilient seal element having spaced sidewalls of a dimension to be received in close tolerance relationship within said groove, said resilient seal element having an inner circumferentially extending face spaced from an outer circumferentially extending face; said inner face is disposed adjacent to the bottom of the groove to thereby form a working chamber therebetween; said outer face is inwardly positioned respective to the outer surface of the connector body, and moves radially outwardly when fluid flows into said working chamber;



said connector body includes a plurality of longitudinally extending counterbores radially spaced about and parallel to said longitudinally extending passageway, means by which the lower end of each said counterbore is in fluid communication with said longitudinally extending passageway; said flow port having one end in communication with said longitudinal counterbore and the other end in fluid communication with said working chamber;

whereby, when the pump apparatus is seated downhole in a borehole and fluid pressure is applied to the pump apparatus, pressure is effected in said working chamber to bias the resilient seal element outwardly against the inner peripheral surface of the collar, whereupon the annular area between the pump apparatus and collar is sealed against flow therethrough; and, when the fluid pressure is reduced, the resilient seal element relaxes into a retracted position respective to the groove, and the outer face of the resilient seal element moves radially inwardly away from the inner peripheral surface of the collar, where the seal element is protected from abrasion when the pump apparatus is returned uphole.

4,403,923

SUBMERSIBLE PUMP

Herbert P. Korchin, 32 Friendship Ct., Red Bank, N.J. 07701

Filed May 12, 1981, Ser. No. 262,925

Int. Cl.³ F04B *39/14*

U.S. Cl. 417—360 **5 Claims**

1. A submersible pump comprising:

a volute having a discharge conduit connected thereto;

a motor housing having a motor therewithin, said motor coupled to an impeller;

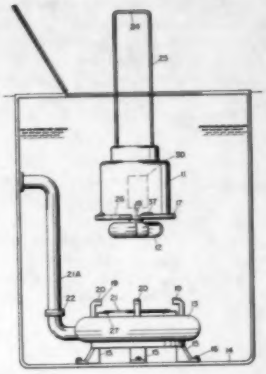
said motor housing further including a flange thereon having slots therein;

guide means extending from said volute aligned with and to extend into said flange slots;

means adjacent on said flange adjacent said slots for engaging said guide means;

said engaging means and said guide means coacting to secure said motor housing to said volute;

said engaging means and said guide means including coacting camming means and contact surfaces operative upon movement of said motor housing relative to said volute;



sealing means between the motor housing flange and the volute;

levering means, comprising a slot in said flange and an aperture in said volute aligned with said slot, into which a tool can be inserted to loosen said flange from said volute;

motor housing twisting means comprising a handle on the side of the motor housing remote from the volute to twist said motor housing relative to said volute so as to engage or disengage said motor housing from said volute.

4,403,924

METHOD AND DEVICE FOR REGULATING THE OUTPUT OF DIAPHRAGM PUMPS

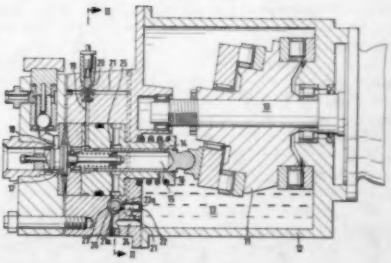
Gerhard Gebauer, Bermatingen, and Fritz Bachschmid, Friedrichshafen, both of Fed. Rep. of Germany, assignors to J. Wagner GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1980, Ser. No. 157,273

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1979, 2923284

Int. Cl.³ F04B *43/00*

U.S. Cl. 417—388 **9 Claims**



1. A method for regulating the output of a diaphragm pump

for delivering driven fluids, (particularly fluids for air-less spraying by means of high pressure spray guns), the pump comprising two chambers separated by a movable diaphragm, one of said chambers being a drive chamber filled with a drive fluid alternately loaded and unloaded by an oscillating piston and the second of said chambers a driven fluid chamber, the pump further including a pressure limiting valve from which drive fluid is discharged in pulsating flow from the drive chamber into a reservoir, and a closable intake aperture passageway for supplying drive fluid from the reservoir into the drive chamber, the method comprising the steps of: retaining a part of the drive fluid outside the drive chamber and reservoir, providing a restriction between the pressure limiting valve and the reservoir for dampening the pressure variations of said drive fluid, and using the dynamic pressure thereof to provide a pressure signal regulating the flow clearance of the intake aperture by controlling a throttleable valve in the intake aperture passageway whereby the intake aperture passageway is reduced in flow capacity with increasing signal pressure and is increased in flow capacity with decreasing signal pressure.

4,403,925

DIAPHRAGM FUEL PUMP AND ASSOCIATED METHOD

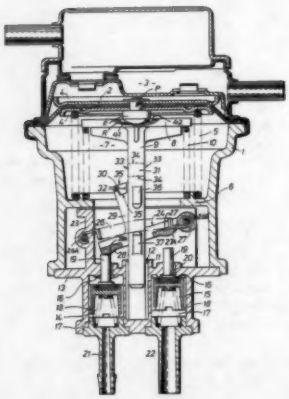
Ernst Kuhlen, Willich, and Manfred Winkels, Dusseldorf, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,752

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034448

Int. Cl.³ F04B *43/06*

U.S. Cl. 417—395 **12 Claims**



1. A diaphragm fuel pump comprising a housing, a diaphragm in said housing forming a pump chamber and a drive chamber therein, said diaphragm being movable between first and second end of stroke positions to draw fuel into said pump chamber and discharge the fuel therefrom, resilient means acting on said diaphragm for urging the diaphragm to one of said end positions, a ram coupled to said diaphragm to undergo movement in opposite directions in accordance with the movement of said diaphragm between said end of stroke positions, first valve means for controlling supply of working fluid to said drive chamber, the supply of working fluid to said drive chamber applying force to said diaphragm to overcome the action of said resilient means and produce displacement of the diaphragm towards the other of said end of stroke positions, second valve means for controlling communication of said drive chamber with atmospheric air, the connection of said working chamber to atmospheric air causing the diaphragm to return to said one end of stroke position under the action of said resilient means, lever means pivotably mounted on said housing for selectively opening and closing said first and second valve means, control means on said lever means and said ram for blocking opening and closing of the first and second valve means until the diaphragm is at said end of stroke positions, said control means including a first segment on said lever means and a second segment on said ram, said segments being respectively positioned on the ram and lever means to face one another to block pivotal movement of the lever means, and actuator means on said ram for urging said lever means to undergo pivotal movement in accordance with the movement of the ram under the action of the diaphragm and resilient means, the positions of said segments on said ram and lever means being such to release the lever means and permit pivotal movement thereof when the diaphragm is at its end of stroke positions, said lever means comprising two lever arms in a common plane, one for actuating the first valve means, the other for actuating the second valve means, and a third lever arm carrying said first segment.

4,403,926

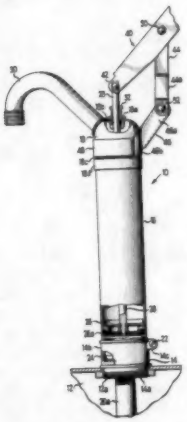
BARREL PUMP

Eugene E. Stamper, Spencer, Iowa, assignor to Witco Chemical Corporation, New York, N.Y.

Filed Feb. 17, 1981, Ser. No. 235,099

Int. Cl.³ F04B *7/04*

U.S. Cl. 417—553 **1 Claim**



1. In a upright mounted pump comprising a cylinder having an upper end provided with a head portion and a lower end provided with means for releasably securing the cylinder on a barrel or drum containing a fluid, said head portion being provided with an annular shoulder and having a spout extending outwardly therefrom in spaced relation to said annular shoulder, a piston and a piston rod for the cylinder, the upper end of the piston rod extending through and outwardly of the head portion on the upper end of the cylinder, a handle for the pump, said handle being pivotally joined at one end to the upper end of said piston rod, a ring-like member having a radius of curvature and a circumference of greater than $\frac{1}{2}$ of the circumference of said head portion positioned on the head portion between the annular shoulder and the base of the spout extending outwardly therefrom, said shoulder and the base of the spout cooperating to limit the extent of the upward and downward movement of the ring-like member on the head portion, said ring-like member being freely turnable at all times on the head portion on the upper end of the cylinder, and interconnecting means comprising bifurcated ear extensions having end members having a radius of curvature substantially conforming to the radius of curvature of said ring-like member

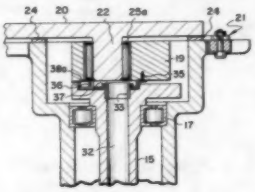
welded to the ring-like member at its extremities and to the handle whereby the handle can be freely swivelled with relation to the upper end of the pump to enable the handle to be operated at substantially any desired angle with relation to the spout on the head portion.

4,403,927

LUBRICANT DISTRIBUTION SYSTEM FOR SCROLL MACHINE

Arthur L. Butterworth, La Crosse, and Robert E. Utter, South Onalaska, both of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Sep. 8, 1981, Ser. No. 300,075
Int. Cl.³ F01C *1/02, 21/04;* F01M *1/02, 9/00*
U.S. Cl. 418—55 **10 Claims**



1. An oil distribution system for lubricating bearings of a scroll machine, comprising

a rotatably driven vertical shaft having an oil pump on its lower end extending into a reservoir of oil, and including an internal oil passage through which oil is conveyed from the pump to the upper end of the shaft on which is mounted a swing link rotatably driven by the shaft;

an oil collector cup disposed adjacent the swing link, around the oil passage in said driven shaft and rotatably driven by the shaft, in receipt of oil flowing out of the oil passage in the shaft when the pump is operating, and operative to retain a small volume of oil when the pump stops so that the oil retained is immediately available to lubricate adjacent bearings of the scroll machine when the pump again starts; and

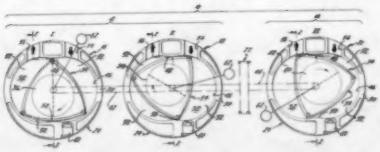
oil distribution means for distributing oil from the oil collector cup to the adjacent bearings including a thrust bearing and a swing link bearing and allocating the flow of oil between the adjacent bearings in proper proportion to insure adequate lubrication thereof, said oil distribution means including one or more passages in fluid communication with the collector cup for conveying oil to bearings outside the swing link.

4,403,928

MULTI-UNIT ROTARY MECHANISM

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 30, 1981, Ser. No. 248,950
Int. Cl.³ F01C *11/00*
U.S. Cl. 418—60 **3 Claims**



1. A three-rotor modular rotary piston mechanism consisting of a single rotor mechanism unit and a two-rotor mechanism unit with each mechanism unit having a mainshaft and wherein each unit has a housing forming a cavity for each rotor which is supported for planetary rotation in the cavity on an eccentric portion of its associated mainshaft so as to form a plurality of working chambers defined between the rotor and housing and which working chambers expand and contract in volumetric size as the rotor planetates relative to the housing, the three-rotor modular mechanism comprising:

(a) the mainshaft for the two-rotor mechanism unit having its associated eccentric portions angularly offset from each other by 120 degrees;

(b) counterweights for each of the single rotor and two-rotor mechanism units being arranged relative to the associated mainshaft to dynamically balance each rotor mechanism unit;

(c) coupling means for connecting the mainshaft of each rotor mechanism unit so as to permit angular, radial and endwise flexibility and torsional stiffness for torque transmission between the connected mainshafts; and

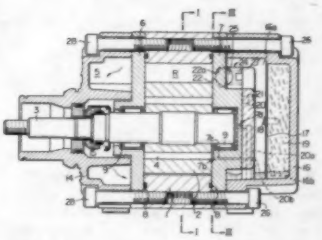
(d) said coupling means interconnecting the mainshafts so that the eccentric portion of the single unit is angularly offset 120 degress from the next adjacent eccentric portion of the mainshaft of the two-rotor mechanism unit to thus provide all eccentric portions of the three-rotor mechanism angularly displaced from each other 120 degrees.

4,403,929

ROTARY COMPRESSOR

Eiichi Nagasaku, Chiryu; Masao Yasunaga, and Kimihiro Kato, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 30, 1981, Ser. No. 229,852
Claims priority, application Japan, Feb. 4, 1980, 55-12882
Int. Cl.³ F04C *29/02*
U.S. Cl. 418—82 **9 Claims**



1. A rotary compressor comprising:

a housing having therethrough a cylindrical bore;

cover plates attached to the axial ends of said housing to close the open axial ends of said cylindrical bore, respectively;

a shaft extending within said cylindrical bore in said housing and rotatably supported by said end plates, said shaft having an axis thereof extending in eccentric relation to the axis of the cylindrical bore in said housing;

a rotor mounted on said shaft for rotation therewith and having a plurality of circumferentially spaced vane grooves, said rotor having axial end faces opposed to inner surfaces of said end plates, respectively;

a vane slidably received in each of said vane grooves, each of said vanes cooperating with the adjacent vane, the wall surface of said cylindrical bore in said housing, the inner surfaces of said end plates and the outer periphery of said rotor to define a working chamber;

one revolution of said rotor including a suction stroke section and a compression stroke section, said working chambers having their volumes increased during said suction stroke section and decreased during said compression stroke section;

an arcuate oil groove formed in the inner surface of at least one of said end plates, said arcuate oil groove extending in the area of the suction stroke section and being substantially coincident with an arcuate path described by the bottoms of said vane grooves;

a cover attached to said one end plate to define therebetween a discharge chamber receiving therein fluid compressed in said working chamber, said discharge chamber having defined at the bottom thereof an oil reservoir;

passage means having therein restrictive means and supplying oil from said oil reservoir to said oil groove through said restriction means so that the pressure of the oil in said oil groove is lower than that in said oil reservoir; and

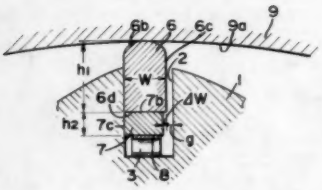
the oil being fed to said vane groove mainly when said vane is in said suction stroke section.

4,403,930

MULTI-PIECE APEX SEAL STRUCTURE FOR A ROTARY PISTON ENGINE

Hiroshi Kodama, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Sep. 2, 1980, Ser. No. 183,043
Claims priority, application Japan, Sep. 3, 1979, 54-122199[U]
Int. Cl.³ F01C *19/04*
U.S. Cl. 418—121 **8 Claims**



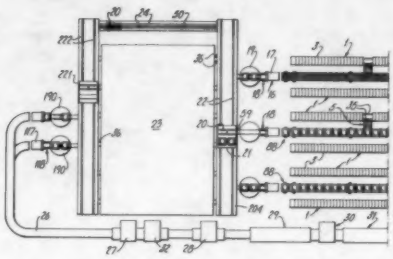
1. Rotary piston engine including a casing which comprises a rotor housing having an inner wall of trochoidal configuration and a pair of side housings attached to the opposite sides of the rotor housing, and a substantially polygonal rotor disposed in the casing with apex portions in sliding engagement with the inner wall of the rotor housing, said rotor having an apex seal structure in each apex portion thereof, said apex seal structure including an apex seal groove having side and bottom walls and a top opening and formed along each apex portion, an apex seal assembly comprised of seal means adapted to be brought into sliding contact with the inner wall of the rotor housing and resilient means for forcing the seal means toward the inner wall of the rotor housing, said apex seal assembly being disposed in said seal groove so that gas pressure is introduced through said top opening to the seal groove to thereby force the seal means toward the inner wall of the rotor housing, said seal means being comprised of a main piece adapted to be engaged with said inner wall of the rotor housing and an under piece located beneath the main piece, said main piece having a pair of side surfaces, a bottom surface which is substantially perpendicular to the side surfaces and a top sealing surface which is adapted to be brought into sliding engagement with the inner wall of the rotor housing, said under piece having a pair of side surfaces and a top surface which is substantially perpendicular to the side surfaces and adapted to be engaged with the bottom surface of the main piece, said main piece having a width between the side surfaces which is greater than that of the under piece.

4,403,931

SEMI-AUTOMATIC PLANT FOR MANUFACTURING SHAPED CONCAVE VITREOUS CHINA OBJECTS

Giorgio Cuman, Milan, and Mario Biadigo, Pordenone, both of Italy, assignors to Ideal Standard S.p.A., Milan, Italy

Filed Jan. 27, 1982, Ser. No. 343,237
Claims priority, application Italy, Feb. 6, 1981, 46813 A/81
Int. Cl.³ B28B *1/26, 15/00, 17/00*
U.S. Cl. 425—84 **14 Claims**



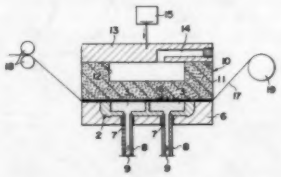
1. A plant for manufacturing shaped concave vitreous china articles, of the type comprising at least one casting line or bench on which there slides, and can be locked, a set of plaster moulds which can be clamped into a pack in order to define the casting cavities therebetween, characterised by comprising at least two parallel casting benches (1), each provided with means (13) for drying the respective plaster moulds (3), in combination with a parking structure (4) for the cast articles (6) which is disposed between said two benches, there being provided means (5) for transferring the articles from the casting benches to the central parking structure; means (18), (19) for withdrawing the articles from said parking structure and loading them on to suitable fork trucks (20), means (190), (118) for unloading the articles from said fork trucks (20), and means (21), (221), (50) for moving said fork trucks in a closed cycle within the drier (23).

4,403,932

APPARATUS FOR LOADING COSMETIC MATERIAL INTO A HOLLOW SPACE

Hirotake Ogasawara, Funabashi; Yoshiharu Hatakeyama, and Mitsuo Ishiguro, both of Tokyo, all of Japan, assignors to Shiseido Company, Ltd and Yoshida Industry Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 204,255, Nov. 5, 1980, Pat. No. 4,374,796. This application Jul. 13, 1981, Ser. No. 282,736
Int. Cl.³ B28B *1/26*
U.S. Cl. 425—85 **14 Claims**



1. An apparatus for molding a cosmetic material, said apparatus comprising:

a mold structure having therein a mold cavity partially defined by a porous absorbing material and partially defined by a casing structure;

means for injecting a fluent mixture of cosmetic material, formed by mixing powder cosmetic material with a binder

and a solvent, into said mold cavity, and thereby for filling said mold cavity with said mixture, whereby said solvent from said mixture is absorbed into said porous absorbing material, thus causing a bonding of said powder cosmetic material in a solid molded shape;

means for separating said porous absorbing material from said solid molded shape of cosmetic material and from said casing structure, thereby retaining said solid molded shape in said casing structure; and

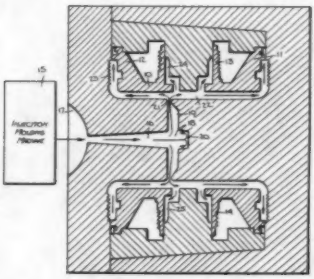
means for, after said porous absorbing material is separated from said solid molded shape, removing absorbed solvent from said porous absorbing material.

4,403,933

APPARATUS FOR INJECTION-MOLDING A LINER ONTO A METAL SPOOL

James W. Davis, New Britain, and Elmer D. Mannherz, Southampton, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Apr. 14, 1982, Ser. No. 368,410
Int. Cl.³ B29F 1/10
U.S. Cl. 425—129 R **7 Claims**



1. Apparatus for injection-molding an insulating liner onto the surface of a metal spool to be included in an electromagnetic flowmeter wherein fluid to be metered is conducted through the lined spool the spool being constituted by a cylindrical body having flanges at either end and a pair of diametrically-opposed circular bosses midway between the end flanges to receive the meter electrodes, said apparatus comprising:

A. a mold adapted to receive the spool to define therewith a liner cavity conforming to the inner surface of the cylindrical body and to the faces of the end flanges, the liner cavity communicating with cavities conforming to the inner surface of the electrode bosses, said mold further including a sprue extending from an inlet along the longitudinal axis of the spool toward the central hub of a runner extending radially from the hub to an annular flash gate opening into the liner cavity at a point adjacent the boss cavities, said annular gate being coaxial with said longitudinal axis and being axisymmetric with the sprue; and

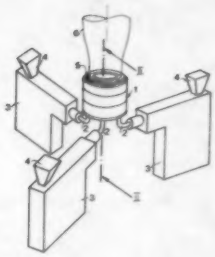
B. means to inject molten molding material containing reinforcing fibers which are randomly oriented into the inlet to cause the material to flow through the sprue into the hub from which it flows through the runner and the axisymmetric flash gate into the liner cavity wherein the material flows in opposite directions from the gate toward the flanges at either end of the spool body to fill the liner cavity and also the boss cavities, said flow being at a rate causing the reinforcing fibers to assume an orientation in the direction of flow whereby the fibers embedded in the molded in the liner are parallel to the spool.

4,403,934

COEXTRUSION DIE

Ole-Bendt Rasmussen, Forchwaldstrasse, CH-6318 Walchwil/-Zug, Switzerland, and Børge Jensen, Virum, Denmark, assignors to Ole-Bendt Rasmussen, Walchwil/Zug, Switzerland

PCT No. PCT/DK81/00023, § 371 Date Oct. 20, 1981, § 102(e) Date Oct. 20, 1981, PCT Pub. No. WO81/02406, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 27, 1981, Ser. No. 314,070
Claims priority, application Denmark, Feb. 29, 1980, 891/80
Int. Cl.³ B29F 3/04
U.S. Cl. 425—192 R **8 Claims**

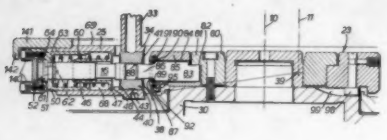


1. An extrusion die for the coextrusion of plural plastic materials into the form of a tubular film, said die comprising: (A) means for separately supplying at least two extrudable plastic materials in a fluid state; (B) a material distribution section comprising an array of annular elements providing a plurality of pairs of mutually contacting surfaces, at least one of said surfaces of each pair being recessed to define a labyrinthine distribution channel system for each such material, said system having an inlet opening connected to one of said supply means and dividing into opposite generally peripherally extending passages terminating in axially extending connecting passages which in turn divide into opposite peripherally extending passages terminating in axially extending connecting passages which in turn divide into oppositely peripherally extending passages terminating in axially connecting passages, the number of said passage divisions being sufficient to provide an array of at least eight peripherally spaced apart connecting passages for each extrudable material opening generally axially through an end wall of said distribution section, the plural distribution channel systems being arranged in radially displaced relation at different radial distances from the centre axis of the extrusion die; (C) an extrusion die section having one end wall contacting said distribution section end wall and comprising a plurality of concentric generally annular elements having generally spaced parallel concentric surfaces defining a plurality of continuous annular collecting chambers, one for each extrudable material, transition passage means communicating between the open ends of each array of said connecting passages from said distribution secton and the interior end of the corresponding collecting chamber, a common continuous annular extrusion slot axially downstream of said collecting chambers and opening through the opposite end wall of said die section, and delivery passage means merging the ends of the collecting chambers to form a common interior end of said extrusion slot spaced upstream from said slot opening; and (D) mechanical engagement means uniting the annular elements of said distribution and extrusion die sections, respectively, and connecting said sections together with said end faces in contact.

4,403,935
TABLETTING MACHINES

Jack Crossley, and David H. Wilson, both of Liverpool, England, assignors to Manesty Machines Limited, Liverpool, England

Filed Mar. 26, 1981, Ser. No. 247,810
Claims priority, application United Kingdom, Mar. 27, 1980, 8010324
Int. Cl.³ B30B *7/00, 11/00*
U.S. Cl. 425—210 **31 Claims**



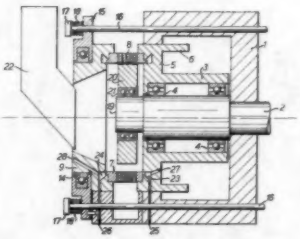
6. A tabletting machine comprising:
a rotatable die table having dies arranged at a surface thereof;
means coupled to the die table to rotate the die table about a first axis;
means to feed powdered or granulated material to be tabletted onto the die table surface to fill the dies;
first punches cooperably coupled with the dies;
first drive means coupled to the first punches to move the first punches to cause them to enter and exit the dies;
second punches cooperably coupled with the first punches and the dies;
second drive means coupled to the second punches and synchronized with the first drive means, the second drive means including means to drive the second punches into the dies to compress the material therein into a tablet between a respective pair of first and second punches, and means to eject the tablet from the die and the machine when the first punch of the pair has exited the die by driving the second punch of the pair through the die;
at least one punch of each pair of first and second punches is a reciprocating punch provided with an individual pump means;
means for slidably supporting the reciprocating punch at one end thereof; and
a sealing sleeve surrounding an intermediate portion of the reciprocating punch and being spaced therefrom in the radial direction thereof to define a substantially annular gap around the intermediate portion of the reciprocating punch;
the individual pump means being operably coupled to the reciprocating punch to be operated by the reciprocating punch to force air through the annular gap defined around the intermediate portion of the reciprocating punch, each time the reciprocating punch is driven in one direction.

12. A tabletting machine comprising:
a rotatable die table having dies arranged at a surface thereof, the die table including means for enclosing a hollow region in the vicinity of the dies;
means coupled to the die table to rotate the die table about a generally upwardly extending first axis;
means to feed powdered or granulated material to be tabletted onto the die table surface to fill the dies, the feed means including a stationary feeder plate disposed in said hollow region for supporting material to be tabletted at one side of the first axis, about the plane of the dies, which material is to be fed across the feeder plate onto the surface of the die table and over the dies on the opposite side of the first axis, and wherein the dies are movable between a position below said feeder plate and a position above said feeder plate as the die table rotates, the feeder plate engaging the surface of the die table to scrape the fill of material in each die level with surface of the die table as the dies move from above to below the feeder plate;
first punches cooperably coupled with the dies and being movable into and out of the dies in a direction substantially perpendicular to the first axis;
first drive means coupled to the first punches to move the first punches to enter and exit the dies;
second punches cooperably coupled with the dies and being associated with the first punches to form pairs of first and second punches, the second punches being movable into and out of the dies in a direction substantially perpendicular to the first axis; and
second drive means coupled to the second punches and synchronized with the first drive means, the second drive means including means to drive the second punches into the dies to compress the fill of material therein into a tablet between a respective pair of the first and second punches, and means to eject the tablet from the die radially inwardly of the die table when the first punch of the pair has exited the die by driving the second punch of the pair through the die.

4,403,936
PRESS FOR COMPRESSING A POWDERY MATERIAL

Theodorus J. Heesen, Selissen 6, Boxtel, Netherlands

Filed May 7, 1981, Ser. No. 261,084
Claims priority, application Netherlands, May 14, 1980, 8002783
Int. Cl.³ B29C *3/00*
U.S. Cl. 425—331 **24 Claims**



1. A press for compressing powdery material to grains comprising a loosely arranged, rotatable, annular, perforated mould supported and guided by a rotatable mould holder and by an axially displaceable supporting member which supports the mould at the end remote from the mould holder, the side face of the mould engaging the mould holder being urged by the supporting member with a given force against the mould holder in the operational position of the press in a manner such that during the operation of the press the mould is caught along by the mould holder owing to the force produced between the mould holder and the mould, whilst a rotatable roller is arranged in the mould, characterized in that an uninterrupted channel is provided at least at the level of the side face of the mould engaging the drivable mould holder.

4,403,937
DEVICE TO SPREAD THE DOUGH FOR PIZZA

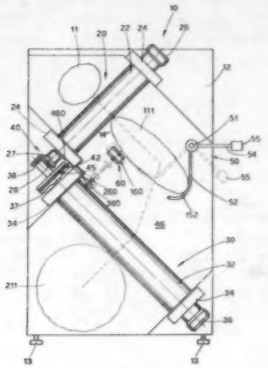
Walter Zamparelli, Udine; Antonio Cimenti, S. Dona' di Piave, and Giuseppe Muscariello, Udine, all of Italy, assignors to Zamuci Srl, Italy

Filed May 27, 1982, Ser. No. 382,551
Claims priority, application Italy, Jun. 18, 1981, 83410 A/81
Int. Cl.³ A21C *3/02*; B29D *7/14*
U.S. Cl. 425—337 **9 Claims**

1. Device for spreading the dough for pizzas in two mutually perpendicular directions comprising:
a carrying structure having a sloping working surface;
a first pair of rollers to roll the dough, supports for said rollers anchored to said sloping surface of the carrying structure;
a second pair of rollers to roll the dough which is positioned

substantially at an angle to said first pair, supports for said second pair of rollers anchored to said sloping surface of the carrying structure;

a metal sheet acting as a sliding surface for the dough and installed on said sloping surface in such a way that the lower rollers of said pairs of rollers protrude partially above said surface, whereby the protrusion of said lower



rollers can be regulated with suitable positioning means that anchor said surface; and

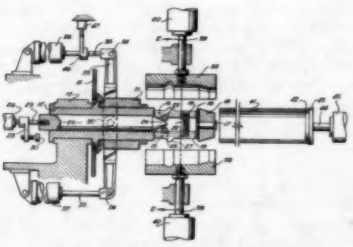
an oscillating supporting and guiding means fitted to said sliding surface in a zone between the two pairs of rollers and able to temporarily and movably support and guide the dough sliding down said surface only when said dough is engaged by said pair of rollers.

4,403,938

PIPE SOCKET FORMING

Barry G. Seach, Castle Hills; Hans Muller, Seven Hills, and Solomon E. Cohen, Eastwood, all of Australia, assignors to James Hardie & Coy. Pty. Limited, New South Wales, Australia

Filed Mar. 14, 1979, Ser. No. 20,545
Claims priority, application Australia, Mar. 20, 1978, 3758
Int. Cl.³ B29C *1/12*
U.S. Cl. 425—393 **4 Claims**



1. Apparatus for forming a socket on an end portion of a pipe in a plastically deformable condition, said apparatus comprising:

a contour die forming an envelope defining the external shape of said socket formed on said end portion of said pipe and adapted to encase said end portion of said pipe;

means disposed at a position remote from said end portion of said pipe for supporting said pipe;

a frusto-conical nose cone having an axis generally coincident with the axis of said pipe and being disposed adjacent an end of said contour die facing said supporting means, said nose cone having a diameter which increases moving in a direction axially away from an end thereof facing said supporting means;

means for thrusting said end portion of said pipe axially toward said contour die to drive said end portion of said pipe into said contour die and concurrently to drive said end portion of said pipe over said nose cone to enlarge said end portion of said pipe;

means for compressing said end portion of said pipe in an axial direction while said end portion of said pipe is disposed within said contour die;

a carrier sleeve having an axis substantially coincident with the axis of said pipe and being rotatable about its axis within saiid contoured die;

a plurality of levers, each lever being pivotally mounted to said carrier sleeve at a fulcrum, each of said levers having trowelling surfaces formed thereon;

means for biasing each of said levers about its respective fulcrum to urge its trowelling surfaces away from interior surfaces of said end portion of said pipe; and

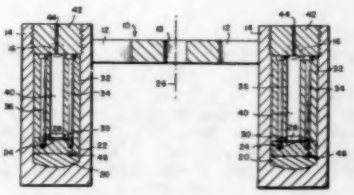
cam means for pivoting each of said levers about its respective fulcrum to urge said trowelling surfaces formed on each of said levers radially outwardly and against interior surfaces of said end portion of said pipe during rotation of said carrier sleeve for circumferential wiping of said interior surfaces of said end portion of said pipe, and for radial shaping of said end portion of said pipe.

4,403,939

PROCESS AND APPARATUS FOR PRODUCING A MOLECULARLY ORIENTED FILM

Kenneth J. Rothschild, Newton, Mass., and Noel A. Clark, Boulder, Colo., assignors to Trustees Boston University, Boston, Mass.

Division of Ser. No. 13,026, Feb. 21, 1979, Pat. No. 4,241,005.
This application Sep. 16, 1980, Ser. No. 187,644
Int. Cl.³ B29C *5/04*
U.S. Cl. 425—425 **2 Claims**



1. Apparatus for forming a film from a suspension or solution of molecules wherein said molecules are uniformly oriented in said film which comprises:

means to house said molecules adapted to be positioned within a centrifugation apparatus having a spin axis wherein said means is formed integrally into a bucket for a swinging bucket centrifugation apparatus;

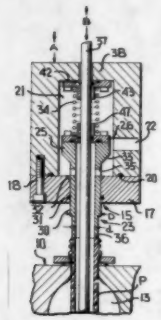
said means having a cavity which includes a gravitational isopotential surface having a radius of curvature equal to the distance of said surface from said spin axis, said isopotential surface being the surface normal to the gravitational forces which are generated when spinning said centrifugation apparatus; and,

means for evaporating solvent or suspended liquid from said cavity while spinning said centrifugation apparatus.

4,403,940
BLOW HEAD VALVE

Suppayan M. Krishnamurnar, Nashua, and Walter R. Jolly, Merrimack, both of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 28, 1981, Ser. No. 315,843
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—529 **4 Claims**

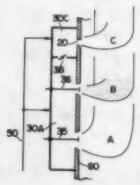


1. A blow head valve for introducing a high pressure blowing gas into a preform in a blow molding operation, said blow head valve comprising a housing defining a gas chamber, said housing including a bottom wall having an opening therethrough, a tubular spool extending through said opening in sealed relation to said bottom wall, said spool having a closed upper end and an open lower end, said spool upper end being disposed within said gas chamber, resilient means normally retaining said spool in a lowered position, and said spool having a blow gas port opening from the interior thereof through an intermediate portion thereof to the exterior thereof, and said blow gas port normally being closed by said bottom wall, said spool lower end forming means for engaging in sealed relation a preform and for moving said spool into said gas chamber and placing said blow gas port in communication with said gas chamber only in the presence of a preform, the seal between said spool and said bottom wall including an openable valve between said spool and said bottom wall, said valve including a tapered valve seat in said bottom wall surrounding said opening, and a valve member projecting from said spool for seating engagement on said valve seat.

4,403,941
COMBUSTION PROCESS FOR REDUCING NITROGEN OXIDES

Kunio Okiura; Iwao Akiyama; Hiroshi Terada; Yoshijiro Arikawa; Akira Baba, and Shigeki Morita, all of Kure, Japan, assignors to Babcock-Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1980, Ser. No. 175,823
Claims priority, application Japan, Aug. 6, 1979, 54-99487
Int. Cl.³ F23N *1/02*
U.S. Cl. 431—10 **12 Claims**

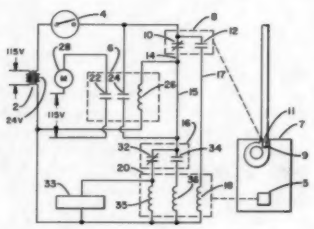


1. A combustion process for reducing nitrogen oxides in combustors which comprises arranging at least one primary burner, at least one secondary burner and at least one air port, successively in this order in the direction of gas stream in the hollow body of a combustor provided with a space for combustion and an exit for combustion exhaust gas; and burning fuels in a ratio of air to fuel less than 1 at said primary burner to form an incomplete combustion zone, burning fuels in a ratio of air to fuel lower than the above-mentioned ratio at said secondary burner to form a reducing combustion zone, and burning fuels at said air port where air is fed in excess amount required for a complete combustion of the fuels, to form a complete combustion zone, respectively, in the free space of the hollow body of the combustor.

4,403,942
SELF-CHECKING SAFETY SWITCH CONTROL CIRCUIT

Lloyd F. Copenhaver, Indianapolis, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 18, 1980, Ser. No. 207,854
Int. Cl.³ F23N *3/00*; F23Q *5/00*
U.S. Cl. 431—24 **10 Claims**



1. Electrical controls for a combustion system of the type having a vent system with a flow sensor for detecting flow of air and products of combustion through the vent system, a blower for mechanically assisting the flow of air and products of combustion through the combustion system, a fuel supply system including a main fuel valve which controls fuel flow to main burners of the combustion system and a pilot fuel valve which controls fuel flow to the main fuel valve and to a pilot burner, a sparker which operates to ignite fuel flowing from the pilot burner, and a thermostat for connecting the electrical controls to a main electrical power supply in response to a demand for combustion and for disconnecting the electrical controls from the main electrical power supply when the demand for combustion is satisfied, said electrical controls comprising:

safety switch circuit means for proving operation of the flow sensor when the electrical controls are connected to the main electrical power supply by the thermostat and for terminating operation of the combustion system when the flow sensor detects no flow through the vent system during operation of the combustion system;

ignition circuit means for operating the sparker to ignite fuel flowing from the pilot burner when the pilot fuel valve is opened;

blower circuit means for turning on the blower when operation of the pilot burner is established; and

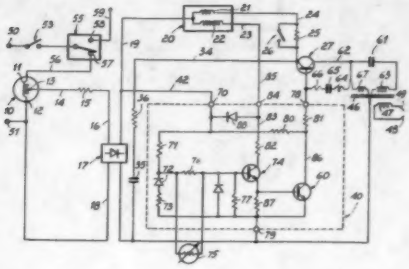
combustion circuit means for opening the pilot fuel valve only when the operation of the flow sensor is proven by the safety switch circuit means and for opening the main fuel valve only when the flow sensor detects flow through the vent system after operation of the pilot burner is established and the blower is turned on.

4,403,943

FLAME SURVEYING MEANS IN BURNER IGNITION

Antonio Stella, and Giuseppe Canova, both of Legnago, Italy, assignors to R.B.L. Riello Bruciatori Legnago S.p.A., Legnago, Italy

Filed Feb. 12, 1981, Ser. No. 233,761
Claims priority, application Italy, May 6, 1980, 21817 A/80
Int. Cl.³ F23N 5/00
U.S. Cl. 431—31 7 Claims



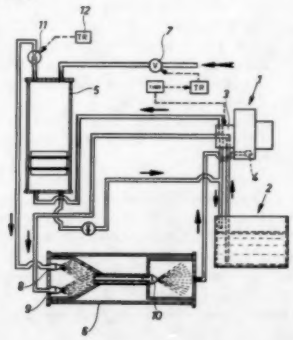
1. An ignition and flame surveying device for a liquid fuel burner comprising an electrically controlled valve which enables the feeding of fuel to said burner and which is provided with a retaining winding for rendering said feeding of fuel permanent during regular burner operation, and which further comprises a combustion chamber pre-purging means and a resistor which determines, after a preselected time period of its heating, the end of a pre-purging cycle, said device further comprising a flame detection photo-sensitive means comprising a photo-resistance which responds to a preset low light intensity to reduce the current which flows through said resistor to such an extent that its heating becomes insufficient to cause the end of said pre-purging cycle, while it responds to a light intensity corresponding to the presence of a flame in said combustion chamber to activate said retaining winding of said valve and to provide other signals necessary for causing said burner to pass to its regular operation mode.

4,403,944

AUXILIARY DEVICE FOR OIL BURNER FOR MIXING WATER AND OIL FOR COMBUSTION

Pentti Pyykkönen, Kangasalantie 6, Järvenpää, Finland

Filed Oct. 10, 1979, Ser. No. 83,406
Int. Cl.³ F23J 7/00
U.S. Cl. 431—90 1 Claim



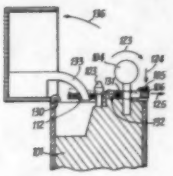
1. Apparatus for supplying a combustion mixture of oil and water to an oil burner having a combustion chamber, said apparatus including an oil supply, a tank and an oil pump and a discharge nozzle at the combustion chamber, said apparatus comprising: a piston mounted in said tank dividing said tank into two chambers, one for oil and one for water, said piston reciprocally movable lengthwise of said tank in response to pressure differentials acting on opposite sides thereof; a source of water under pressure connected to one of the chambers in said tank; a valve between said tank and its water source, means responsive to the firing of said oil burner for closing said valve while the oil burner is firing; conduit means connecting said oil pump to the other chamber in said tank to subject the water content of said tank to the same pressure as the oil being pumped by said pump; a first mixing chamber and a pair of adjacent nozzles, one of said nozzles being connected to said oil pump and the other being connected to said one chamber of said tank; for discharing both oil and water into said chamber to intermix the same; a second chamber and a third nozzle communicating with said first chamber for discharging the oil/water mix from said first chamber into said second chamber; conduit means interconnecting said second chamber with said discharge nozzle in said combustion chamber for conducting the oil/water mixture to said discharge nozzle.

4,403,945

GAS LIGHTER FOR SMOKERS

Imre Leitgib, Vesenaz, Switzerland, assignor to Usiflamme S.A., Villars-sur-Glane, Switzerland

Filed Oct. 21, 1980, Ser. No. 199,271
Claims priority, application France, Oct. 30, 1979, 79 26889
Int. Cl.³ F23Q 2/00
U.S. Cl. 431—150 8 Claims



3. Gas lighter comprising a body, a cover movable between an open position and a closed position relative to the body, and defining with the body, an interior space when the cover is in the closed position on the body, a valve mounted on the body in said space to be moved from a closed position, in which flow of gas is prevented, to an open position which permits the gas to flow, a valve lever mounted on said body to permit the opening of the valve, said valve lever being movable from a retracted position where it is entirely contained in said space to an operating position extending outside said space where it can be activated by the user to open the valve, and means to displace the valve lever from its retracted position to the operating position in response to displacement of the cover from its closed position to its open position.

4,403,946

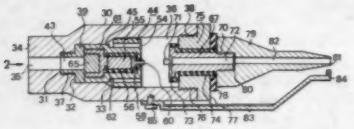
IGNITER UTILIZING PIEZO-ELECTRIC ELEMENT

Seiji Kagawa, No. 27-1-126, 3-Chome, Baba, Tsurumi-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Oct. 7, 1981, Ser. No. 309,426
Claims priority, application Japan, Oct. 23, 1980, 55/147638; Oct. 25, 1980, 55/149960; Jun. 16, 1981, 56/92782
Int. Cl.³ F23Q 3/00
U.S. Cl. 431—255 8 Claims

1. An igniter utilizing a piezo-electric element, comprising a cylindrical body having a gas passage, a movable piezo-electric unit provided in the space in said cylindrical body so as to be movable axially of said cylindrical body by the pressure of a gas flowing in said gas passage, a stator adapted to produce a

magnetic attraction between said stator and said movable piezo-electric unit, said stator being provided fixedly in said cylindrical body on its gas passage side and having a through-hole in communication with said gas passage, and a conductor disposed in said cylindrical body on its side opposite from said stator such that said movable piezo-electric unit will impinge thereagainst when said unit is moved, said conductor having a gas passage and fixed in its position while electrically insulated from said cylindrical body by an insulator, said conductor being also electrically connected to one of the discharging



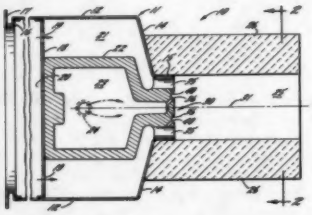
electrodes while the other discharging electrode is electrically connected to said cylindrical body in a spaced-apart relation with the first-said discharging electrode, said movable piezo-electric unit being provided with a piezo-electric element disposed in the space of said cylindrical body through an insulator, said piezo-electric element being held and fixed in position by a pressure-receiving terminal adapted to receive the pressing force of the gas flowing in the gas passage in said cylindrical body and an impact terminal provided at the impact receiving face of said conductor.

4,403,947

GAS MIXING BURNER

Lyle S. Spielman, Rockford, Ill., assignor to Eclipse, Inc., Rockford, Ill.

Filed Aug. 12, 1981, Ser. No. 292,229
Int. Cl.³ F23D *15/02*
U.S. Cl. 431—353 **13 Claims**



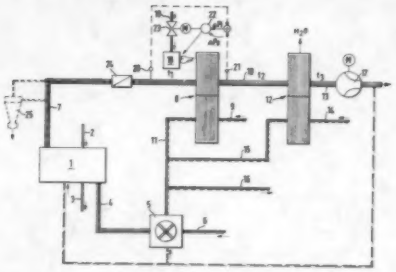
1. A gas mixing burner comprising means defining air, fuel and combustion chambers, means for supplying pressurized air and fuel to said air and fuel chambers, respectively, said air and fuel chambers each having an outlet end, said combustion chamber having an inlet end located adjacent the outlet ends of said air and fuel chambers, and mixing means located between the inlet end of said combustion chamber and the outlet ends of said air and fuel chambers, said mixing means comprising a structure having first and second spaced apart rows of combustion air passages leading from said air chamber to said combustion chamber, first and second rows of fuel passages formed through said mixing means between said rows of combustion air passages and leading from said fuel chamber to said combustion chamber, said rows of fuel passages diverging away from one another as such passages progress toward said combustion chamber, a first row of stabilizing air passages formed through said mixing means between said first row of combustion air passages and said first row of fuel passages and leading from said air chamber to said combustion chamber, and a second row of stabilizing air passages formed through said mixing means between said second row of combustion air passages and said second row of fuel passages and leading from said air chamber to said combustion chamber, said rows of stabilizing air passages converging toward one another as such passages progress toward said combustion chamber.

4,403,948

SYSTEM FOR SEPARATION OF VOLATILE SUBSTANCES FROM WASTE GASES

Günter Waldmann, Packenreiterstr. 18b, and Franz Plesch, Gotthord Str. 4, both of D-8000 Muenchen, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,335
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009938
Int. Cl.³ F26B *3/04*
U.S. Cl. 432—1 **54 Claims**



1. An apparatus for separation of carried combustible and/or condensable and/or precipitable substances from the waste gas of drying installations comprising a drying chamber; a supply line to the drying chamber for feeding material to be dried; an offtake line connected to the drying chamber for removing dried stock; an input line to said drying chamber for feeding in hot air; a waste has output line connectedd to said drying chamber for removing waste gas; a first heat exchanger connected to the waste gas output line and having a waste gas outlet; an inlet and an outlet for exchange fluid; said first heat exchanger providing for cooling of the hot waste gas coming from the drying chamber to a temperature sufficient for depositing volatile substances; heating means for evaporating and/or subliming the deposited volatile substances; and switching means to allow for alternately turning on the exchange fluid for cooling of the waste gas or the heating means.

4,403,949

ROSIN FLUX FILTRATION SYSTEM

Edward J. March, Lower Makefield Township, Bucks County, Pa., and George M. Wenger, Franklin Township, Somerset County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,151
Int. Cl.³ F24H *7/00*; F27B *9/00*; B01D *9/04*
U.S. Cl. 432—29 **9 Claims**

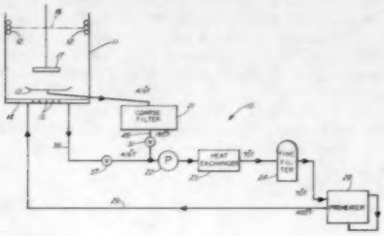
1. A method of removing flux from a liquid-flux mixture draining from an article subjected to condensing, hot, saturated vapor of the liquid from a boiling reservoir of the liquid in a condensation heating facility, the method comprising the steps of:

diverting the draining mixture, from the boiling liquid reservoir, into a first flux filter;

accumulating the mixture in the first flux filter to remove a portion of the flux therefrom;

alternately discharging the filtered mixture from the first flux filter and the liquid from the reservoir to provide a continuous flow into a heat exchanger to lower the tem-

perature thereof to precipitate out flux residue therein; and



passing the liquid with the precipitate therein, through a second flux filter resulting in a substantially flux free heat transfer liquid.

4,403,950

FIXING DEVICE

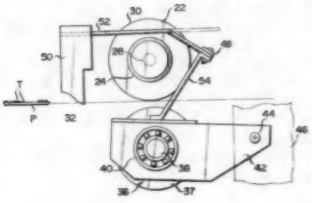
Michio Maeda, Ooiso, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 17, 1982, Ser. No. 419,604

Claims priority, application Japan, Oct. 9, 1981, 56-150294[U]

Int. Cl.³ G03G *15/20*

U.S. Cl. 432—60 **7 Claims**



1. A fixing device comprising:

a first rotatable roller in a fixed position;

heating means provided in the first roller for heating the same;

a second rotatable roller facing the first roller and capable of being in contact therewith; and

shifting means deformable by heat from the first roller and movably supporting the second roller for separating the second roller from the first roller at normal temperature, and for pressing the second roller against the first roller when the shifting means is deformed by heat from the first roller heated by the heating means.

4,403,951

SHAFT FURNACE FOR BURNING OR FIRING AND SINTERING MATERIAL IN LUMP FORM OR PELLET FORM AND WITH AN INTERNAL BURNER

Ulrich Beckenbach, Fontanestr. 13, and Helmuth Beckenbach, An den Linden 47, both of D-4005 Meerbusch 1, Fed. Rep. of Germany

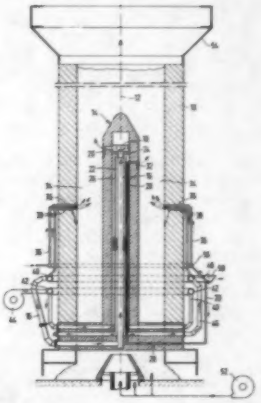
Filed Dec. 24, 1981, Ser. No. 334,429

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125320

Int. Cl.³ F27D *1/08, 15/02*

U.S. Cl. 432—96 **22 Claims**

1. A shaft furnace for burning and sintering material in lump form, which material is selected from a group consisting of limestone, dolomite and the like, said furnace comprising a furnace shell, an upright internal burner being arranged centrally in the furnace shell in the vicinity of the furnace bottom, said furnace shell and burner having substantially rotationally symmetrical cross-sections at right angles to the longitudinal axis of the furnace and defining an annular space therebetween, said internal burner in a concentrically positioned manner to one another having a central combustion air duct with a combustion air distribution chamber being arranged in the vicinity of an upper end of the air duct and having a plurality of air outlets discharging laterally into the annular space, an internal cooling air duct surrounding said combustion air duct, an external cooling air duct surrounding the internal cooling air duct and being in communication therewith in the vicinity of



an upper end by means of a cooling air deflection chamber, means for introducing cooling air into a bottom of the external air duct being arranged in the vicinity of the furnace bottom with the cooling air flowing upward through the external cooling air duct and down through the intrnal air duct, said internal cooling air duct having an air outlet being positioned in the vicinity of the furnace bottom and extending to a first container being disposed outside of the shaft furnace, a supply line for supplying the combustion air duct with combustion air from the first container, and means for supply fuel including fuel gas supply lines being positioned within the external cooling air duct and haviang fuel gas outlets in the vicinity of the upper end of each fuel gas supply line and below the level of the air outlets of the combustion air distribution chamber.

4,403,952

APPARATUS FOR DRIVING A ROTARY DRUM, SUCH AS A ROTARY KILN

Per Birch, Copenhagen, and Christian Marcussen, Valby, both of Denmark, assignors to F. L. Smidth & Co., Cresskill, N.J.

Filed Nov. 2, 1981, Ser. No. 317,466

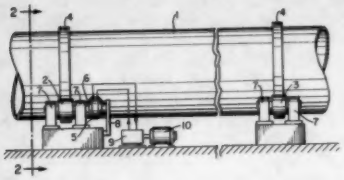
Claims priority, application Denmark, Nov. 4, 1980, 4668/80

Int. Cl.³ F27B *7/00*

U.S. Cl. 432—103 **8 Claims**

8. A rotary kiln comprising a rotary drum rotating about an axis, more than two spaced apart live rings adapted for being positioned about the drum, more than two roller pairs on which the drum is mounted, each pair of rollers being positioned for engagement with a respective live ring, at least two individual power circuits each including a hydrostatic motor, a variable displacement hydrostatic pump and a pump drive motor, at least two individual rollers of said roller pairs each being driven individually by its own respective hydrostatic motor, characterized in that the torque distribution for the

drum is provided by the hydrostatic motors distributed in the respective power circuits, the torque distribution being set at



predetermined levels such that the slip in any individual power circuit lies within predetermined limits.

4,403,953

APPARATUS AND PROCESS OF TRANSFERRING THE VESSELS IN A TUNNEL FURNACE

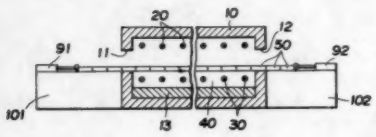
Sousuke Suzuki, Ichikawa, Japan, assignor to Furnace Industrial Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,572

Claims priority, application Japan, Oct. 21, 1980, 55-147900; Apr. 1, 1981, 56-47256

Int. Cl.³ F27B *9/14;* **F27D** *3/04, 3/00*

U.S. Cl. 432—122 **3 Claims**



1. A transfer apparatus for transferring vessels through a tunnel furnace having a built-in heating apparatus, the vessels having predetermined widths, said transfer apparatus comprising:

carrier receiving means extending horizontally between an inlet and an outlet of the furnace for supporting carrier slide plates;

a plurality of carrier slide plates made from heat-resisting and abrasion-proof material and adjacently connected to each other, said carrier slide plates being slidably mounted on the carrier receiving means, having upper surfaces supporting said vessels, and having smaller widths than the widths of the vessels and being longitudinally reciprocative in the furnace on the carrier receiving means;

vertically movable lifting means for lifting vessels off of said carrier slide plates so that said carrier slide plates are horizontally movable with respect to the lifted vessels, said lifting means being operable to return the lifted vessels to the carrier slide plates;

supporting means mounted on the lifting means for engaging portions of the vessels protruding from side edges of said carrier slide plates to thereby support the vessels during lifting movement thereof; and

drive means for horizontally moving said carrier slide plates, said carrier slide plates being moved in a first direction to incrementally advance vessels through said tunnel furnace and being moved in a direction opposite said first direction after the vessels have been lifted off of said carrier slide plates.

4,403,954

APPARATUS FOR HEAT-TREATING PIPES

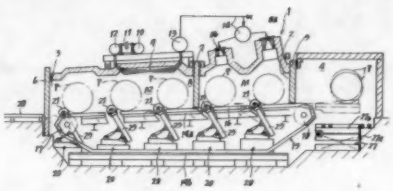
Hitoshi Kokeguchi, Takarazuka; Jiro Yamaguchi, Itami; Akinori Sakoda, Amagasaki; Mikio Umeda, Kawanishi; Tadashi Yamashita, Nishinomiya; Yoshimasa Katsuki, Takarazuka; Mitsuru Murakami, Kobe, and Yasuo Imamura, Amagasaki, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jul. 24, 1981, Ser. No. 286,369

Claims priority, application Japan, Aug. 8, 1980, 55-109435; Aug. 8, 1980, 55-109437; Oct. 13, 1980, 55-143526; Oct. 13, 1980, 55-143527

Int. Cl.³ F27B *9/14, 3/04;* **B65G** *15/00, 15/64*

U.S. Cl. 432—124 **15 Claims**



1. An apparatus for heat-treating pipes comprising a furnace chamber having an inlet and an outlet and capable of accomodating a plurality of pipes arranged in parallel at suitable spacing, a plurality of main chains disposed in the furnace chamber and drivingly movable in a direction at right angles to the axes of the pipes for providing a path of transport of the pipes, a plurality of means for stopping the pipes intermittently at suitably spaced-apart positions in the path of transport to cause them to rotate about their own axes in cooperation with the main chains and for correcting the axial displacement of the pipes, and sensor means provided in corresponding relation to each of the stopping and correcting means for detecting the axial displacement of a corresponding pipe to control the stopping and correcting means so that the pipe is brought to a specified axial position on the path of transport.

4,403,955

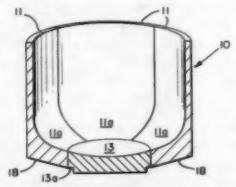
RECEPTACLE FOR SUPPORT OF A MELT CONTAINING CRUCIBLE

Nicola Sarno, Vancouver, Wash., assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 22, 1982, Ser. No. 350,797

Int. Cl.³ F27B *14/08, 14/14*

U.S. Cl. 432—158 **5 Claims**



1. A crucible recepticle adapted for complete contact support of a melt containing crucible in a softened state wherein an improved recepticle comprises:

(a) a segmented cup-shaped recepticle for completely supporting the softened crucible comprising a plurality of similar separate rigid elevational segments,

(b) the elevational segments being separable to relieve thermal stresses during cooling of the crucible and its supporting recepticle,

(c) the segments having inwardly formed lower portions adapted to bias the elevational segments to adjoining positions by gravity for support of sides of the crucible,

(d) a central annular base segment adjoining, but separate from lower ends of the elevational segments for supporting a central portion of a melt containing crucible, the base segment being of rigid material and having a generally concave upper surface conforming to a central complimentary bottom portion of the melt containing crucible, and

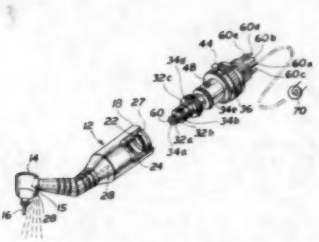
(e) an annular base plate of rigid material for supporting the elevational and base segments having a flange tapered inwardly and downwardly cooperating with a complimentary lower surface of the elevational segments to bias the elevational segments to adjoining positions.

4,403,956

DENTAL HANDPIECE HAVING AN OPTICAL FIBERSCOPE

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg., Co., Ltd., Kanuma, Japan

Filed Jul. 13, 1981, Ser. No. 282,737
Claims priority, application Japan, Jul. 14, 1980, 55-99806[U]
Int. Cl.³ A61C *1/00*
U.S. Cl. 433—29 **3 Claims**



1. A dental handpiece for connection to a dental unit comprising:

an outer sleeve having a front end and a rear end;

a powerhead assembly, including means for holding a dental tool and an air-powered turbine wheel, supported on said front end of said outer sleeve, said powerhead assembly having an opening to the exterior thereof adjacent said holding means;

said outer sleeve having an inner circumferential surface defining an internal space;

a sleeve bearing including a circumferentially closed side wall, held in said space of said outer sleeve, said sleeve bearing also having:

a stepped rearwardly increasing diameter cylindrical internal surface including first, second and third stepped cylindrical surfaces and first, second and third radially extending surfaces respectively adjacent said first, second and third stepped cylindrical surfaces, enclosing a stepped cylindrical space,

a first central, axial passage having a front and a rear end, said rear end of said first central axial passage opening into said stepped cylindrical space,

first and second side passages, each respectively having front and rear ends, near and around said first central passage, the rear ends of said first and second side passages opening axially into said stepped cylindrical space, the front ends of said first and second side passages opening axially into the front end of said outer sleeve,

a third side passage opening at one end into the rear end of said first side passage and opening at the other end exteriorly of said side wall, and

a radially extending exhaust passage opening to the exterior of said sleeve bearing inside said outer sleeve and to the interior of said stepped cylindrical space rearward of said rear end of said second passage;

a first fiberscope having a front end and a rear end, extending axially through said first central passage, said front end of said fiberscope extending into said powerhead assembly and protruding slightly out of said opening in said powerhead assembly, said rear end of said first fiberscope protruding into said stepped cylindrical space;

a central pipe connecting the front end of said first central passage into the powerhead for supplying chip air thereto;

a first side pipe, connecting said front end of said first side passage to said air powered turbine wheel in said powerhead assembly, for supplying air under pressure thereto;

a second side pipe connecting said front end of said second side passage into said powerhead for supplying water thereto;

a second fiberscope;

means, having a front end and a rear end and including a forwardly reducing cylindrical plug at said front end thereof, for releasably connecting said sleeve to the dental unit, a rear internal portion of said sleeve bearing being so shaped as to form a socket for snugly and axially, rotatably receiving said plug, said connecting means being releasably connected into said sleeve bearing at said rear end thereof; said plug including:

first, second and third coaxial, respectively rearwardly increasing diameter cylindrical walls,

a first flat radially extending exterior front wall at the front end of said first cylindrical wall and,

second and third radially extending ring-shaped walls at the front ends of said second and third cylindrical walls, respectively,

each of said first, second and third radially extending walls respectively confronting said first, second and third radially extending surfaces in respective spaced relation thereto;

said plug having:

a radially large hollow portion defining a hollow space,

a second primary central axial passage, opening at opposite ends at the forward end of said hollow sapce and in said first radially extending wall at the forward end of said stepped cylindrical space, for holding said second fiberscope,

a fourth side passage having a rear end opening into said hollow space and a front end opening axially in one of said second and third radially extending walls in spaced communication with the rear end of said first side passage, to supply pressurized air thereto,

a fifth side passage having a rear end opening onto said hollow space and a front end opening axially in said first radially extending wall into the forward end of said stepped cylindrical space for supplying chip air thereto,

a sixth forwardly and radially outwardly angled side passage having a rear end opening into said hollow space and a front end opening through the other of said second and third radially extending walls into spaced communication with the rear end of said second side passage, and

a radially extending second exhaust passage coinciding with said first exhaust passage and opening to the exterior of said sleeve bearing and said rear end of said third side passage through said first exhaust passage and to the interior of said hollow space, for exhausting water and pressurized air;

said second fiberscope extending through said second central passage and having a front end abutting said rear end of said first fiberscope;

a mount insert having five axially extending insert passages, fitted to said connecting means rearward of said hollow space;

four insert pipes, three of said four insert pipes and the rear end of said second fiberscope respectively extending through four of said five insert passages, through said hollow space and into said fourth, fifth and sixth side

passages and said second central passage, respectively; and

a fifth insert pipe extending into the fifth of said five insert passages for exhausting water and pressurized air from said second exhaust passage; whereby fluid and light communication between said five insert pipes and said powerhead assembly is maintained irrespective of the axial rotation of said plug relative to said sleeve bearing, the front end face of said second fiberscope being slidingly rotatable against the rear end face of said first fiberscope.

4,403,957

DENTAL HANDPIECE HAVING OWN ELECTRICAL LIGHT SOURCE

Walter Mössle, Bad Waldsee; Bernhard Lingenhole, and Eugen Eibofner, both of Biberach, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed May 6, 1982, Ser. No. 375,766

Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3119689

Int. Cl.³ A61C *1/00, 3/00*

U.S. Cl. 433—29 **18 Claims**

1. In a dental handpiece including a gripping sleeve; a drive aggregate arranged within said handpiece for a dental treatment worktool retained in a head portion; a built-in electrical light source for said handpiece; an intermediate member for said light source and conduits for supply media, said intermediate member being interchangeably arranged between the gripping sleeve and the end member of a supply hose for the supply media for the handpiece, the light of said light source being conducted to the region of the handpiece head portion through a strand-like light conductor arranged interiorly of said handpiece and extending from said gripping sleeve while being directed at said head portion onto the dental treatment tool; and compressed air-actuated pneumatic switch means for activating and deactivating said light source; the improvement comprising in that said cylindrical intermediate member contains said light source and said pneumatic switch means.

4,403,958

DENTAL COMPRESSED-AIR MOTOR

Gerd Löhn, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,051

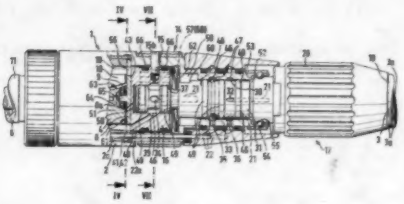
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009337

Int. Cl.³ A61C *1/02*

U.S. Cl. 433—100 **18 Claims**

1. In a dental compressed-air motor, a housing; a rotatably supported rotor in said housing adapted to be rotated by compressed drive air introduced through a compressed drive air inlet conduit; a rotor shaft connectable with a work tool on said rotor, regulating means including externally operable handgrip means in said housing and being turnable through said regulating means for varying the rotational speed and/or the direction of rotation of said rotor; first coupling means at one end of said housing for connection with a dental handpiece mounting said work tool and second coupling means formed by an attachment element for connection with a supply hose conveying compressed air or other flow media towards or from said housing and said handpiece, said rotary slide valve being arranged intermediate said rotor and said attachment element, said attachment element including essentially axially entering and axially extending media through-passageways connected with media conduits leading to the location of use of the compressed-air motor and handpiece; the improvement comprising:

said attachment element including an axial guide spigot axially detachably insertable into a receiving aperature of said housing open towards the connecting side and into which there extends said media passageways and terminate in outlet openings at the side of said guide spigot, said outlet openings being sealed relative to each other and being at predetermined spacings, said housing including inlet openings on the side wall of the receiving aperture associated with the outlet openings of the guide spigot which are in communication with the outlet openings of said guide spigot upon insertion of the latter and from



which there extend the media conduits leading to a location of use for said handpiece; said rotary slide valve including a central cylindrical insertion aperture extending substantially along the entire axial length of the rotary slide valve for receiving a cylindrical end portion of said guide spigot, said end portion having at least one side outlet opening for compressed drive air which in each turned position of the rotary slide valve is in communication with at least one compressed drive air inlet opening on the side wall of the insertion aperture and from which there extends at least one media conduit representing the compressed drive air passageways in said rotary slide valve, and whose outlet openings are adapted to be superimposed on at least one inlet opening of at least one conduit leading to the displacement space of said rotor in said housing representing a location of use.

4,403,959

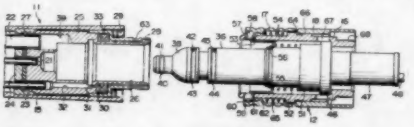
COUPLING DEVICE FOR A DENTAL INSTRUMENT

Narito Hatakeyama, Ichikawa, Japan, assignor to Kabushiki Kaisha Yoshida Seisakusho, Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,824

Int. Cl.³ A61C *1/08*

U.S. Cl. 433—126 **10 Claims**



1. A coupling device for a dental instrument comprising a dental instrument body having a drive means driven by a fluid medium, said instrument body having a first fluid passage for supplying said medium to said drive means disposed within a front half portion thereof and a fitting recess in communication with said first passage disposed within a rear half portion thereof; a hose portion having an insert cylinder inserted into said fitting recess disposed at the foremost end thereof, said hose portion having a supply hose for supplying said medium connected to a rear end thereof, said hose portion being interi-

orly formed with a second fluid passage to provide communication between said first passage and said supply hose, said second fluid passage extending in an axial direction; and a coupling device for detachably connecting said instrument body with said hose portion; said coupling device comprising a sleeve fitted over said hose portion, said sleeve having an opening, a ball-like stop member inserted into said opening and movable in a radial direction, said stop member having a larger diameter than the wall thickness of said sleeve, a connection cylinder inserted into said sleeve having an external diameter substantially equal to the internal diameter of said sleeve and having a front end coaxially mounted on the rear end of said instrument body, and an operating ring fitted over said sleeve and movable between a first position and a second position positioned axially of said sleeve with a clearance formed therebetween; said connection cylinder being formed on its outer peripheral surface with an annular groove to receive therein said stop member when said insert cylinder is inserted into said fitting recess into a locking position; said operating ring being formed in its inner periphery with a first annular surface at the front end thereof so that when said operating ring is positioned in said first position, the inner radial portion of said stop member is positioned in the same place as the inner peripheral surface of said sleeve, and a second annular surface on said operating ring having a smaller diameter than that of said first annular surface so that when said operating ring is positioned in said second position, the inner radial portion of said stop member extends into said annular groove to provide a lock fitting between said instrument body and said hose portion, said operating ring having an abutment which is engaged by said stop member when said operating ring is in said second position wherein the engagement of said abutment and said stop member determines said second position of said operating ring, said coupling device being released by manually grasping said operating ring to move the latter axially from said second position to said first position such that said abutment is disengaged from said stop member, said stop member being thereby released from said annular groove by said axial movement of said operating ring to thereby permit detachment of said instrument body from said hose portion.

4,403,960

EXTRACORONAL HOLDING MEMBER FOR DENTAL PROSTHESES

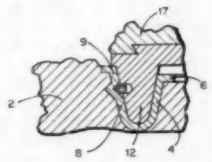
Robert Hauri, Bahnhofstrasse 33, Aarau, and Peter Reinhard, Weingartenstrasse 8, Spreitenbach, both of Switzerland

Filed Mar. 11, 1982, Ser. No. 357,274

Claims priority, application Switzerland, Jun. 18, 1981, 4043/81

Int. Cl.³ A61C *13/22*

U.S. Cl. 433—177 **20 Claims**



1. A holding member assembly for dental prostheses, comprising

a female member having an inner wall and an outer wall coupled by a bottom member defining a generally annular cavity therebetween, said outer wall having a radially outwardly extending flange reinforcing said female member;

a male member having a generally toroidal portion shaped and dimensioned to be closely received in said female member cavity;

an annular spring for releasably holding said members together;

means, in said cavity, for receiving said spring; and

means for securing one of said members to at least one tooth of a wearer and the other of said members to a prosthesis;

whereby the assembly securely couples a prosthesis to a tooth, is stable and has a reduced overall height.

4,403,961

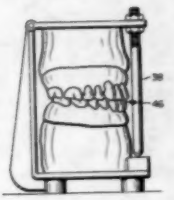
METHOD AND APPARATUS FOR FABRICATING DENTAL PROSTHETICS

John I. Gurney, 2921 Weathervane, Dallas, Tex. 75228

Filed Jan. 12, 1982, Ser. No. 339,004

Int. Cl.³ A61C *9/00*

U.S. Cl. 433—213 **5 Claims**



1. A method for fabricating three directional dental prosthetics comprising the steps of:

(1) preparing a wax setup containing artificial dentures of the patient's arches;

(2) trying the wax setup prepared in step (1) in the patient's mouth to determine centric occlusion;

(3) making a matrix of the setup prepared in step 1 when the result in step (2) is satisfactory;

(4) preparing a set of pumice teeth by pouring a pumice compound into the matrix formed in step (3) and allowing said compound to harden;

(5) preparing a duplicate setup containing pumice teeth by transferring the pumice teeth prepared in step (4) onto duplicate models of the patient's upper or lower arches;

(6) mounting the duplicate setup prepared in step 5 in the patient's mouth;

(7) abrasively milling incisal-occlusal surfaces in the pumice teeth corresponding to the patient's natural mandibular movements by exercising the duplicate setup containing pumice teeth in the patient's mouth; and

(8) mechanically reproducing the incisal-occlusal surfaces of said pumice teeth on said artificial dentures in said wax setup from said duplicate setup.

4,403,962

MANNEQUIN HEAD FOR TRAINING

Leonard A. La Vista, 185 Seminol Blvd., Melbourne, Fla. 32901

Filed Dec. 11, 1981, Ser. No. 329,762

Int. Cl.³ G09B *25/00*

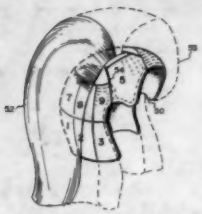
U.S. Cl. 434—94 **9 Claims**

2. An instructional aid for teaching hairstyling and the like comprising:

a cap formed from a thin, flexible material approximately the size and shape of the hair bearing portion of a human head;

a plurality of markings on the outer surface of said cap for providing a guide to a hairdresser in practicing a hairstyling technique; and

hair strands attached over said markings on the outer surface of said cap to simulate a human head of hair, said markings



formed to be visible during practicing of a hairstyling technique.

4,403,963

FOUNDATION COMPOSITION SUITABLE FOR USE IN MAKING UP A MANNEQUIN

Jun Yoshida, Kamakura; Toshiharu Tsunemitsu, Yokohama, and Masayoshi Nakano, Tokyo, all of Japan, assignors to Kanebo Cosmetics, Inc., Tokyo, Japan

Continuation of Ser. No. 181,847, Aug. 27, 1980, abandoned.
This application Dec. 2, 1981, Ser. No. 326,911
Claims priority, application Japan, Aug. 31, 1979, 54-111872
Int. Cl.³ G09B 25/00
U.S. Cl. 434—100 9 Claims

1. A method for making-up an artificial mannequin with a make-up material for a human body, comprising undercoating a skin surface layer of an artificial mannequin made from a synthetic resin, with a foundation composition which comprises a dispersion or solution of a polymeric film-forming material in water, a water-insoluble white powder material and water, the particles of said water-insoluble white powder material having an average size of from 2 to 100 microns, and the content of said water-insoluble white powder material being in a range of from 20 to 60 based on the entire weight of said composition, and making up said undercoated skin surface layer with the make-up material for a human body.

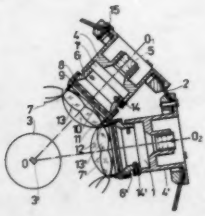
9. An artificial mannequin having a skin surface layer of a synthetic resin and made up by the method as claimed in claim 1.

4,403,964

STAR PROJECTORS FOR PLANETARIA

Ludwig Meier, Jena, German Democratic Rep., assignor to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Oct. 20, 1981, Ser. No. 308,902
Claims priority, application German Democratic Rep., Dec. 1, 1980, 225598
Int. Cl.³ G09B 27/00
U.S. Cl. 434—286 2 Claims



1. A projection device for projecting stars particular for use in planetaria comprising:

a substantially spherical housing,

a plurality of holes in said housing,

a light source being arranged substantially in the center of said spherical housing,

said light source emitting a plurality of radial beams,

a plurality of projectors, each of said projectors being located in one of said holes,

each of said projectors having a mount and a condenser lens and an objective in said mount,

each of said plurality of projectors having an optical axis coinciding with a respective one of said plurality of radial beams,

said objective and said condenser lens of said projectors being in optical alignment with a respective one of said optical axes,

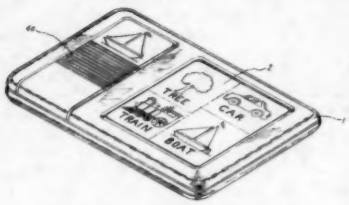
the condenser lenses being arranged in opposition to said light source, and having a polygonal circumferential face each side of said polygonal circumferential face contacting a respective side of neighbouring condenser lens circumferential faces.

4,403,965

ELECTRONIC TEACHING APPARATUS

William R. Hawkins, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 1, 1980, Ser. No. 192,978
Int. Cl.³ G09B 7/06
U.S. Cl. 434—327 12 Claims



1. An electronic teaching apparatus comprising:

a housing having a substantially planar surface;

a plurality of overlays adapted to be individually disposed on said substantially planar surface of said housing, each of said overlays having a plurality of pictorial representations provided thereon;

coding means associated with each of said plurality of overlays and identifying each respective overlay;

keyboard means disposed in said housing and located in registration with said substantially planar surface thereof so as to be disposed beneath an overlay when placed upon said substantially planar surface of said housing, said keyboard means being programmable in accordance with said coding means associated with the particular overlay disposed on said substantially planar surface of said housing for establishing changeable individual boundaries comprising keys respectively corresponding to each of said plurality of pictorial representations of the overlay disposed on said substantially planar surface of said housing, said keyboard means being responsive to the touching by an operator of a particular one of said plurality of pictorial representations as provided by an overlay when disposed upon said substantially planar surface of said housing for generating an input signal;

memory means having digital data stored therein including digital speech data from which synthesized speech as descriptive words in a human language may be derived corresponding to each of said plurality of pictorial representations as provided by each of said plurality of overlays;

controller means responsive to said input signal generated by said keyboard means in accordance with the touching by

the operator of a particular one of said plurality of pictorial representations provided by the overlay disposed on said substantially planar surface of said housing to selectively access stored digital speech data from said memory means corresponding to the particular one of said pictorial representations touched by the operator;

speech synthesis means operably associated with said memory means for generating analog signals representative of human speech and corresponding to the particular one of said pictorial representations touched by the operator; and

audio means coupled to said speech synthesis means for converting said analog signals into audible human speech identifying the particular pictorial representation touched by the operator.

4,403,966

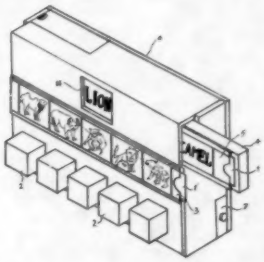
CHILDREN CONDUCTIVE INTELLIGENCE AUTOSUGGESTION MACHINE

Rong-Juh Yang, No. 242, Ta-Lung St., Taipei, Taiwan

Filed Apr. 20, 1981, Ser. No. 252,671

Int. Cl.³ G09B *3/00*

U.S. Cl. 434—335 **7 Claims**



1. An educational device comprising:

a machine box having a display window therein;

a first information bearing support having a plurality of information items;

a second information bearing support having a plurality of information bearing items, each item of said second support corresponding to an information item of said first support;

a first holding means fixed to said box and divided into a plurality of sections for holding said first information support, each section for displaying one item of information of said first information support, all times of said information support being displayed simultaneously;

a set of user actuated keys, one key being associated with each section of said first holding means and corresponding to one item of information of said first information support;

a second holding means, movable with respect to said machine box for holding said second information support for displaying one at a time, an item of information of said second information support via said display window; and

means associated with said keys for actuating an alarm when a key associated with an item of information of said first support corresponding to the item of information of said second support displayed via said display window is depressed; and

an alarm actuatable by said means for actuating to produce an alarm when a key is depressed corresponding to the item of information displayed via said display window.

4,403,967

SELF TEACHING INSTRUMENT

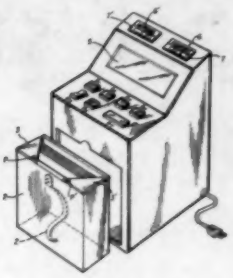
Kyu S. Cho, K. P. O. Box 341, Seoul, Rep. of Korea

Filed Sep. 21, 1981, Ser. No. 304,262

Claims priority, application Rep. of Korea, Sep. 26, 1980, 6262/1980[U]; Sep. 26, 1980, 6266/1980[U]; Oct. 21, 1980, 6745/1980[U]

Int. Cl.³ G09B *5/02*

U.S. Cl. 434—337 **1 Claim**



1. A self-teaching machine comprising:

a main body having a lower front portion, and an upper portion, said upper portion having a viewing screen therein;

a card compartment removeably fitted in said lower front portion, said compartment having a front wall and a rear wall;

a plurality of individual flexible cards vertically oriented in said card compartment, each card having a length, a pair of upper corners, and a pair of transport holes, each hole being adjusted one of said upper corners;

a plate spring mounted on said front wall biasing said vertically oriented cards towards said rear wall,

a collecting section in said main body receiving said individual cards;

means extending through said rear wall for moving one of said cards at a time vertically upwards;

means for individually conveying said cards to and past said viewing screen, said means for conveying receiving said cards one at a time from said means for vertically moving and, subsequently dropping said cards under the influence of gravity into said collecting section; said means for conveying comprising a plurality of rollers, a flexible belt disposed over said rollers, and a plurality of pairs of hooks on said belt spaced apart from each other at a distance greater than said pair of hooks being positioned to catch said pair of transport holes in one card; and

means for intermittently driving said means for vertically moving and said means for conveying upon a command by a user.

4,403,968

MARINE TRANSMISSION GEAR UNIT WITH DOUBLE DRIVE

Günther Heidrich, Burgberg, and Karl Stölzle, Sonthofen, both of Fed. Rep. of Germany, assignors to BHS-Bayerische Berg-, Hutten-und Salzwerke, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1979, Ser. No. 69,303

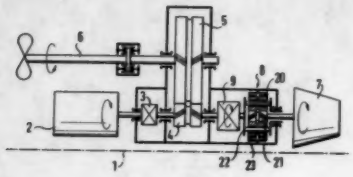
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1978, 2837044

Int. Cl.³ B63H *23/10*

U.S. Cl. 440—3 **28 Claims**

1. In a multiple-step marine transmission gear unit with double drive for use with a pair of driving engines arranged on one side of and parallel to the axis of a propeller shaft driven thereby and on both sides of a slow speed main step of a trans-

mission gearing assembly including a single common pinion and a greater gear, the pair of engines arranged to drive the greater gear of the slow speed main step of transmission by way of the single common pinion as the slow speed main step, the invention comprising at least one high speed secondary



gear means operably coupled between one of the driving engines and the single common pinion and at least one switching aggregate arranged directly coupled to the slow speed main step between the secondary gear means and the main step, the input from both of said engines being coaxial with said single common pinion.

4,403,969

OUTBOARD DRIVE

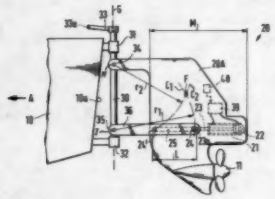
Heinz Pichl, Uppsala, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Feb. 20, 1981, Ser. No. 236,208

Claims priority, application Sweden, Feb. 21, 1980, 8001353; May 27, 1980, 8003906

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—56 **38 Claims**



1. An outboard drive, comprising a casing having propulsion means providing a forward force on said casing for forward drive; mounting means adapted for mounting said casing on a boat and having tilt pivot means for pivotally mounting said casing on a tilt axis on said mounting means for downward forward tilt movement to a drive position and for upward rearward tilt movement to tilt position and linkage means connecting said casing to said mounting means at points spaced below said tilt axis for transmitting forward force urging said casing toward said drive position from said casing to said mounting means and permitting said casing to tilt rearwardly in response to a predetermined rearward force to a tilt position and having hinge means on said mounting means with a hinge axis spaced below and parallel to said tilt axis, guide means fixed on said casing and having a front end, a rear end and a longitudinal guide extending from said rear end longitudinally forwardly to said front end closer to said hinge axis and front of said casing all fixed relative to each other and to said casing, connecting means mounted on said guide means for guided longitudinal movement along said fixed longitudinal guide of said guide means between said front end and said rear end, mechanical means connecting said casing to said connecting means and support arm means connected at one end to said connecting means and at the other end to said hinge means for pivotal movement on said mounting means about said hinge axis and said linkage means further including engagement means having an engaged position in response to forward force for transferring forward force from said casing through said linkage means with unvariable length to said mounting means and a disengaged position in response to rearward force for elongation of said linkage means for rearward tilt movement of said casing to a tilt position.

4,403,970

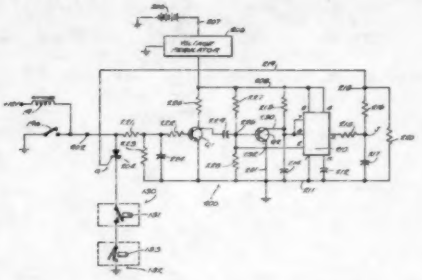
MARINE PROPULSION UNIT HAVING IGNITION INTERRUPTION MEANS TO ASSIST TRANSMISSION SHIFTING

Robert G. Dretzka, South Milwaukee; James L. Holt, Bristol, both of Wis., and Guy D. Payne, Lake Villa, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 30, 1981, Ser. No. 288,469

Int. Cl.³ B63H *23/08*

U.S. Cl. 440—75 **10 Claims**



10. An ignition interruption circuit for facilitating transmission shifting by reducing the speed of an internal combustion engine having an ignition circuit and included in a marine propulsion system comprising a propeller shaft, and a transmission having power input means coupled to the engine, power output means coupled to the propeller shaft, and a clutch element shiftable from an inactive neutral position to an active position for engaging the power input means with the power output means, said ignition interruption circuit comprising input means for receiving ignition pulses from said ignition system, a series circuit between said input means and ground, semiconductor switch means in said series circuit and having a control gate which, when energized, closes said semiconductor switch means to enable bypassing conduction of ignition pulses to ground, means for energizing said gate in response to engine speed above a predetermined speed, a normally open switch connected in said series circuit, means responsive to resistance to transmission shifting for closing said normally open switch to enable passage to ground of ignition pulses when said semiconductor switch means is closed, thereby to reduce engine speed, a normally closed switch in said series circuit, and means for opening said normally closed switch in response to the clutch element having effected complete engagement of the power input means to the power output means to thereby prevent said semiconductor switch means from bypassing any ignition pulses.

4,403,971

INTAKE DUCT FOR AN OUTBOARD ENGINE

Seiji Kobayashi, and Hiroshi Harada, both of Shizuoka, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 4, 1981, Ser. No. 260,168

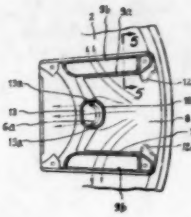
Claims priority, application Japan, Jun. 5, 1980, 55-59687

Int. Cl.³ B63H *5/12*

U.S. Cl. 440—88 **4 Claims**

1. An intake duct for an outboard engine, said engine having

a cowling atop it, said cowling having a recess in its rear top portion above said engine, a right and a left first side walls, an opening at the rear, and a back wall opposed to said opening; a cover plate enclosing the top of said recess, and completing, with said cowling, said rear opening; a side intake port above each of said first side walls and below said cover plate extending for a substantial length at an upper elevation adjacent to said cover plate, and opening into said cowling in a direction lateral to said cowling; an uprightly-standing annular wall rising from said cowling with an open end having a peripheral



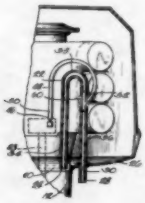
edge facing upwardly toward and spaced from said cover plate and passing through said cowling to form a central intake port, a notch is provided in the upper end of said annular wall at its left hand side and at its right hand side, said annular wall being in the path of air entering from said rear opening; air flow into said recess flowing through said rear opening and impinging on said back wall and on said annular wall, and then dividing to flow sidewardly to and through said side intake ports in an initial direction lateral to said cowling, and also flowing up and over said edge and said central intake port.

4,403,972

MARINE PROPULSION DEVICE INCLUDING ENGINE HOUSING PUMP MECHANISM

Gerald F. Bland, and Allen N. Ladwig, both of Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 5, 1982, Ser. No. 365,616
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—88 **9 Claims**



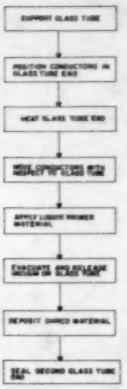
9. A marine propulsion device comprising an engine having cooling passages and a water pump for forcing cooling water through said cooling passages to cool said engine, a lower unit extending downwardly from said engine, a propeller supported by said lower unit and rotatably driven by said engine, a housing surrounding said engine and including a portion defining a chamber which may collect water, means for bleeding water from said cooling passages and for discharging water from said engine so as to provide a signal that said water pump is operating, said means for bleeding including a bleed conduit having one end connected to said cooling passages and an opposite end outside said engine housing, and siphon means for removing water from said chamber, said siphon means including a siphon conduit having an inlet end positioned in said chamber, and said siphon conduit being connected to said bleed conduit.

4,403,973

PHOTOFLASH LAMP STRUCTURE AND FABRICATION PROCESS

John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 4, 1981, Ser. No. 270,288
Int. Cl.³ H01J *9/18*
U.S. Cl. 445—28 **6 Claims**



1. A photoflash lamp fabricating process comprising the steps of:

supporting an elongated glass tube with oppositely disposed first and second open ends;

positioning a pair of electrical conductors within said first open end of said glass tube, each of said electrical conductors having an inward end within said glass tube;

heating said first open end of said glass tube to cause said glass tube to collapse and provide a seal surrounding said pair of electrical conductors;

moving said pair of electrical conductors and said glass tube in opposite directions to cause said inward end of at least one of said pair of electrical conductors to form a recessed portion in said seal surrounding said electrical conductor with said recessed portion extending from said inward end of said electrical conductor to the interior of said glass tube;

applying a primer material in liquid form bridging said pair of electrical conductors internal of said glass tube;

evacuating and releasing the vacuum on said glass tube to cause said liquid primer material to contact said inward end of at least one of said pair of electrical conductors within said recessed portion of said seal of said glass tube and to extend to the other one of said electrical conductors;

depositing a quantity of combustible filamentary material within said glass tube having a sealed first end; and

sealing said second open end of said glass tube to provide a hermetically sealed glass envelope.

4,403,974

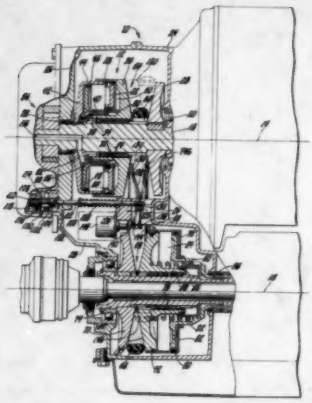
POSITION CONTROL MECHANISM FOR A VARIABLE DRIVE RATIO PULLEY SYSTEM

James F. Sherman, Brighton, and William J. Vukovich, Ypsilanti, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1980, Ser. No. 204,955
Int. Cl.³ F16H *11/06, 11/04*
U.S. Cl. 474—11 **2 Claims**

1. A position control mechanism for a variable drive mechanism having a sheave with an axially stationary member and an axially movable member, said axially movable member having a fluid pressure operated portion; said position control mechanism comprising: a source of fluid pressure; valve means opera-

tively connected to said source of fluid pressure for controlling the delivery of fluid pressure to said fluid pressure operated portion; reciprocable actuator means for controlling said valve means; resilient means for continuously urging said actuator means in one direction into abutment with said valve means; lever means having spaced ends and connecting means intermediate the ends for operatively connecting said lever means with said actuator means; one of said ends being maintained in contact with said axially movable member by said resilient means; and control means operatively maintained in abutment



with the other end of said lever means by said resilient means, said control means being operable to pivot said lever means about said one end when a change in the variable drive mechanism in one direction is desired so that said actuator means will be moved by movable connecting means to permit said valve means to direct fluid pressure to cause a change in the axial position of said axially movable member resulting in pivoting of the lever means about said other end which will permit said resilient means to move the actuator means to discontinue operation of said valve means when the position of the axial movable member desired by the control means is achieved.

4,403,975

CONE-PULLEY BELT-TYPE TRANSMISSION

Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to P.I.V. Antrieb Werner Reimers GmbH & Co. KG., Bad Homburg, Fed. Rep. of Germany

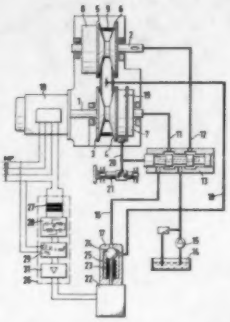
Filed Oct. 30, 1980, Ser. No. 202,420

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1979, 2946295

Int. Cl.³ F16H *11/02, 9/18*

U.S. Cl. 474—18 **6 Claims**

1. In an infinitely variable cone pulley transmission having a driving shaft connected to a source of driving power, a driven shaft, a pair of conical discs nonrotatably mounted on each shaft with at least one disc of each pair being axially displaceable on its associated shaft, an endless transmission element connecting and adapted to run between the two pairs of discs for transmitting power between the shafts, means defining a cylinder-piston unit associated with one axially displaceable disc of each pair for urging that disc toward the other disc of the same pair with a force proportional to the pressure of fluid in the unit, supply means of a pressure fluid, a distributing valve connected to act on the movable disc of one pair and additionally arranged to be arbitrarily adjusted to vary the speed ratio of the transmission, a line connecting the supply means to the distributing valve and conducting means connecting the distributing valve to each cylinder-piston unit for supplying pressure fluid thereto, and a normally-closed control valve connected in fluid flow communication with the distributing valve for controlling the fluid pressure in the cylinder-piston unit associated with the driven shaft, the control valve including means for controlling its closing force, the improvement wherein said closing force controlling means comprise: an electro-magnetic actuator having an energizing winding and connected to cause the closing force presented by said



control valve to be proportional to the current through said winding; and means connected to supply said winding with a current proportional to the torque being transmitted by said transmission, whereby the closing force presented by said control valve to fluid in said cylinder-piston unit associated with said driven shaft is proportional to the torque.

4,403,976

CLUTCH FOR BELT DRIVE

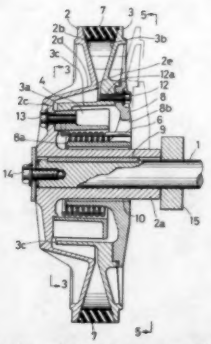
Izumi Takagi, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jun. 13, 1980, Ser. No. 159,411

Claims priority, application Japan, Jun. 13, 1979, 54-74898

Int. Cl.³ F16H *55/56*

U.S. Cl. 474—19 **4 Claims**



1. A driven clutch for a V-belt type automatic transmission adapted to be mounted on a rotatable shaft, said clutch comprising a fixed sheave adapted to be secured to said shaft, a movable sheave including a flange, said sheave and said flange being movable axially and rotatable relative to said shaft, said sheaves together forming an annular space therebetween for receiving a belt, said sheaves and flange forming another annular substantially enclosed space, cam means connected between said sheaves and including at least one cam surface for providing driving engagement between said sheaves and for changing the width of said annular space between said sheaves, and tension and torsion spring means connecting said sheaves for urging said movable sheave toward said fixed sheave and for angularly biasing said movable sheave relative to said fixed

sheave so as to be urged through said cam means toward said fixed sheave, both said spring means and cam means being located within said annular enclosed space.

4,403,977

BICYCLE CHAIN-SHIFTING DEVICE

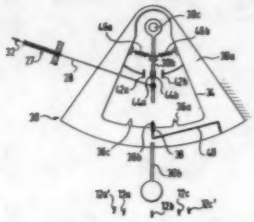
Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Apr. 1, 1981, Ser. No. 249,837

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013771

Int. Cl.³ F16H *11/00*

U.S. Cl. 474—80 9 Claims



1. In a chain-shifting device for a bicycle or the like comprising

a switch unit (30), said switch unit (30) including a switch frame (30*a*) to be attached to a part of the bicycle, an operating member (30*b*) swingingly mounted on said switch frame (30*a*) about a swinging axis (30*c*), said operating member (30*b*) being adjustable into a plurality of predetermined angular operating member positions (12*a*–12*c*) about said swinging axis (30*c*) with respect to said switch frame (30*a*), said operating member positions (12*a*–12*c*) being defined by releasable locking means;

a chain mover support member (23) to be attached to the bicycle frame;

a chain mover unit (16–21) mounted on said chain mover support member (23) by guiding means (22) guiding said chain mover unit (16–21) along a path of movement with respect to said chain mover support member (23);

first spring means (32) biasing said chain mover unit (16–21) towards one end of said path of movement;

transmission means (27) extending between said operating member (30*b*) and said chain mover unit (16–21), said transmission means (27) including a pulling member (28), said chain mover unit (16–21) being movable by said operating member (30*b*) via said transmission means (27) and against the action of said first spring means (32) into a plurality of chain shift positions corresponding to said plurality of operating member positions (12*a*–12*c*),

the improvement which comprises that

(a) a switch member (34) is mounted on said switch frame (30*a*) for swinging movement about said axis (30*c*);

(b) said releasable locking means (38;36*a*–36*c*) are provided in part on said switch frame (30*a*) and in part on said switch member (34) and defining a plurality of angular switch member positions (36*a*–36*c*) about said swinging axis (30*c*) with respect to said switch frame (30*a*), said releasable locking means (38; 36*a*–36*c*) being releasable by a predetermined locking means releasing torque acting onto said switch member (34);

(c) abutment means (44*a*, 44*b*; 42*a*, 42*b*) are provided in part on said operating member (30*b*) and in part on said switch member (34) for defining two angularly offset terminal positions of said operating member (30*b*) with respect to said switch member (34) and for transmitting a locking means releasing torque from said operating member (30*b*) to said switch member (34);

(d) said operating member (30*b*) is elastically biased towards a rest position with respect to said switch member (34) by a biasing torque, said biasing torque resisting against deflection of said operating member (30*b*) from said rest position towards at least one of said terminal positions, said biasing torque being smaller than said releasing torque;

(e) said predetermined operating member positions are defined by respective switch member positions (36*a*–36*c*) when said operating member (30*b*) is in said rest position with respect to said switch member (34).

4,403,978

DERAILLEUR FOR A CYCLE

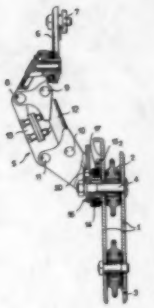
Roger H. M. Huret, Nanterre, France, assignor to Etablissements Huret & Fils, Nanterre, France

Filed Oct. 14, 1980, Ser. No. 196,515

Claims priority, application France, Oct. 5, 1979, 79 24903

Int. Cl.³ F16H *11/00;* B60G *13/00*

U.S. Cl. 474—82 3 Claims



1. Derailleur for a cycle comprising a yoke provided with a chain-guide pinion and a chain-tensioning pinion, said yoke being pivotably mounted by means of a pivot on a support, said support being provided with means for attachment to the fork lug of a cycle and with means enabling the yoke to undergo translational movement, a coil-type adjusting spring arranged around the pivot between the yoke and its support, said coil-type spring comprising a single metal wire forming sets of cylindrical coils uneven in number and arranged coaxially one around the other, each set of coils having several convolutions of said wire.

4,403,979

PULLEY FOR POSITIVE DRIVE SYSTEMS

Frank L. Wujick, Sao Paulo, Brazil, assignor to Uniroyal, Inc., New York, N.Y.

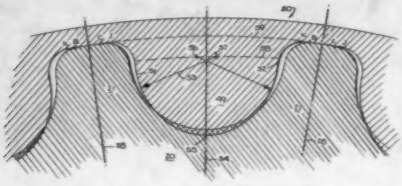
Continuation of Ser. No. 140,950, Apr. 16, 1980, abandoned, which is a continuation of Ser. No. 864,045, Dec. 23, 1977, abandoned. This application May 29, 1981, Ser. No. 268,426

Int. Cl.³ F16H *7/02*

U.S. Cl. 474—153 13 Claims

1. A power transmission system consisting of at least one small diameter toothed pulley in combination with a flexible toothed belt having belt teeth of cross-sectional contour substantially composed of two substantially circular arcs defining substantially curved belt tooth tips, the pulley teeth being composed of tip portions connected by cavity portions, each tip portion having a longitudinal cross-sectional contour partially composed of two substantially circular arcs, said arcs having centers of curvature displaced from each other, the center of curvature of each arc being located on the same side of the center line of said tip portion as its respective arc, the outermost portion of each tooth tip joining the two arcs forming a line segment, the length of the line segment being from

6% to 33% of the width of the belt teeth, and the distance between the outermost portion of the pulley teeth cavities and



the innermost portion of the pulley teeth cavities being less than the depth of the belt teeth which are not in contact with the pulley.

4,403,980

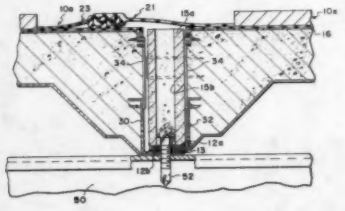
PREFABRICATED WATERTIGHT STRUCTURAL SYSTEM

Harold G. Simpson, Oklahoma City, and Michael L. Roberts, Norman, both of Okla., assignors to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 336,364, Feb. 27, 1973, Pat. No. 4,078,351. This application Oct. 22, 1975, Ser. No. 624,587

Int. Cl.³ E04D *3/362, 1/28*

U.S. Cl. 52—309.11 **2 Claims**



1. The prefabricated panel for a building system which comprises;

a rectangular lower sheet metal member having opposite side edges and opposite end edges, a rolled portion forming a side lip of multiple thickness along each side edge and an up-turned flange extending substantially the length of each side edge, each up-turned flange being inset from the outer edge of the side lip to provide an area of multiple thickness through which a self-tapping fastener may be passed to connect the lower sheet metal member to an underlying support structure;

a flat upper sheet metal member having down-turned flanges at each side edge thereof substantially aligned with the respective up-turned flanges of the lower sheet metal member and extending substantially the length of the upper sheet metal member, the edges of the down-turned flanges being spaced from the edges of the up-turned flanges;

a body of insulating material filling the space between the sheet metal members and between the up-turned and down-turned flanges;

the upper sheet metal member and the body of insulating material terminating short of one end of the lower sheet metal member such that the lower sheet metal member protrudes to form an end lip; and

a plurality of U-shapcd staples disposed at spaced intervals along each side of the panel, each staple having points penetrating the respective aligned up-turned and down-turned flanges for establishing a tension connection between the upper sheet metal member and the lower sheet metal member while permitting substantially independent thermal expansion and contraction of the lower and upper sheet metal members in both directions of the plane of the respective members, the staples including barb means on the points for retaining the points in the respective flanges.

4,403,981

FOLDING MACHINE

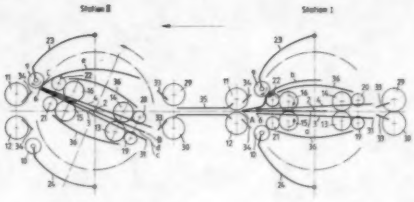
Werner Wüthrich, Gümligen, Switzerland, assignor to Hasler AG, Bern, Switzerland

Filed Feb. 24, 1982, Ser. No. 352,056

Claims priority, application Switzerland, Feb. 26, 1981, 1321/81

Int. Cl.³ B65H *45/14*

U.S. Cl. 493—419 **9 Claims**



1. A machine for folding material consisting of one or several sheets to be folded, jointly, having at least one folding station, comprising

a cartridge (1) including two guide walls (3,4) defining a space therebetween for receiving a portion (a; c,d) of the sheet material and having two opposite gap-like end openings each defined between a pair of coresponding edges of said walls (3,4);

means mounting said cartridge to rotate about an axis (2,41) transverse to said cartridge and to repeatedly turn said cartridge (1) by 180° from one rest position to another, said axis (2,41) being arranged along a center line between said end openings of said cartridge (1) so that said end openings move on a common circular path during turning of said cartridge (1);

a pair of supply rollers (29,30) connected adjacent said common circular path and operable for supplying said material to be folded toward said cartridge (1) for introducing said portion (a; c, d) of said sheet material into said space of said cartridge (1) through one of said end openings thereof;

at least one pressure roller (9,10), means (23,24) resiliently mounting said at least one pressure roller (9,10) adjacent said circular path for movement on a path crossing said circular path and resiliently urging said at least one pressure roller in an inward direction toward said axis thereof for rolling engagement with one of said pairs of edges of one of said guide walls (3, 4) and on an outer face of that guide wall (3, 4) adjacent that edge as the cartridge rotates about its axis, said portion (a;c,d) of said sheet material being introduced into said space in a substantially parallel position between said guide walls with said portion (b;e) to be folded extending outside of said walls, whereby the rotation of said cartridge causes said pressure roller to pre-fold said portion (b;e) of said sheet material to be folded about said one edge;

a pair of withdrawing and final folding rollers (11,12) connected adjacent said common circular path and operable for withdrawing said sheet material from said cartridge (1) and for finally folding said pre-folded material by said pressure roller (9,10);

said pair of supply rollers (29, 30) and said pair of withdrawing and final folding rollers (11,12) each adjoining one of said two end openings of said cartridge (1) in each of said rest positions thereof and said pressure roller (9, 10) being

situated beside said pair of pressure and final folding rollers (11,12); and

at least one pair of transport rollers (13,14,15,16) on said cartridge (1), means connected to operate said at least one pair of transport rollers in an advanced controlled manner during stand still of the cartridge (1) to transport within said space of said cartridge (1) said portion (a; c,d) of said sheet material supplied by said supply rollers (29, 30) and to move out of said space said portion (a; c, d), thereby moving said material (a, b; c, d, e) to said pair of withdrawing and final folding rollers (11,12), and during turning of said cartridge (1) to stand still for holding said portion (a; c,d) of said material stationary within said space.

4,403,982

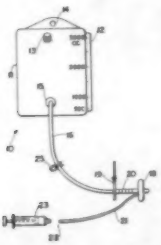
COLON CLEANSING SYSTEM AND TECHNIQUE

Ralph S. Clayton, 1309 Canterbury Dr., Abilene, Tex. 79602

Continuation of Ser. No. 937,591, Aug. 28, 1978, abandoned. This application Sep. 8, 1980, Ser. No. 185,037

Int. Cl.³ A61M *3/00*

U.S. Cl. 604—28 **62 Claims**



1. A method of cleansing a person's entire colon of solid and/or liquid materials therein, comprising the following steps:

in the absence of any prior colon cleansing treatment by means of orally taken laxatives, filling the colon completely with an aqueous liquid by introducing the liquid through the anal opening in sufficient quantity to fill the colon to the extent of distending the wall of the colon from the rectum to the cecum, wherein the liquid includes an ingredient which assists the liquid in loosening and removing the solid material,

assuring that the aqueous liquid is retained in the person's colon for a predetermined period of time,

while said liquid is being retained in the colon, causing motion of the liquid back and forth through the person's colon, such that the liquid moves relative to the walls of the colon to facilitate removal fo solid materials from the colon lining,

and removing all obstructions to permit the person to expel substantially the entire quantity of solids and liquids from the colon.

4,403,983

DUAL LUMEN SUBCLAVIAN CANNULA

William Edelman, Long Beach, and Michael Baranowski, Corona Del Mar, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Filed Nov. 6, 1981, Ser. No. 318,715

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—43 **6 Claims**

1. A dual lumen subclavian cannula suitable for semi-permanent use, comprising:

a flexible tube divided into first and second flow lumens by a flexible longitudinal septum, centrally located within said tube;

the proximal end of said tube fitted to a manifold for separately collecting fluid from said first lumen and distributing fluid into said second lumen;

the distal end of the tube wall enclosing said second lumen tapered to a closed blunt point at the axis of said septum, and provided with a distal opening by at least one aperture proximal to the tapered section of the tube wall;

the distal end of the tube wall enclosing said first lumen extended to a position substantially opposite the proximal end of the tapered section of said second lumen and not closed, to provide a first distal opening for said first lumen; and

a second distal opening for said first lumen provided by at least one aperture in the tube wall proximal to said distal opening in said second lumen.

4,403,984

SYSTEM FOR DEMAND-BASED ADMINSTRATION OF INSULIN

Stephen R. Ash, Lafayette, Ind., and Marvin P. Loeb, Chicago, Ill., assignors to Biotek, Inc., Arlington Heights, Ill.

Continuation-in-part of Ser. No. 107,965, Dec. 28, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,710

Int. Cl.³ A61B *5/00*; G01N *27/26*

U.S. Cl. 604—50 **9 Claims**

1. The method for delivering insulin to a patient which comprises

implanting into said patient, and in contact with a body fluid of said patient, a transducer means responsive to a physical property of said body fluid and generating an output signal which is a function of said physical property;

providing said patient with an insulin dispenser means adapted to deliver insulin transcutaneously to said patient;

providing a dispenser control means operably associated with said dispenser means so as to regulate delivery of insulin to said patient in response to a control signal; and

applying the output signal generated by said transducer means to said dispensing control means as said control signal.

4,403,985

JET CONTROLLED CATHETER

John W. Boretos, Rockville, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 12, 1981, Ser. No. 262,806

Int. Cl.³ A61M *25/00*

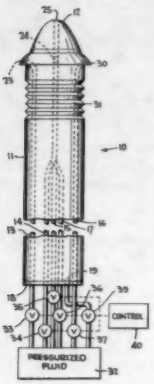
U.S. Cl. 604—53 **14 Claims**

1. An improved vascular catheter arrangement for use in traversing a network of tortuous blood vessel passages, comprising:

an elongated flexible catheter tube for traversing said blood vessel passages and having a forward end and a rearward end, said tube also having a circumferential periphery with a plurality of control ports defined therethrough at

predetermined angularly spaced locations proximate said forward end; and

control means for controllably bending said tube transversely of the length of the tube, within said blood vessel passage network, by selectively delivering pressurized fluid from said rearward end for issuance through selected



control ports to impart transversely directed reactive thrust forces on said tube proximate said forward end.

12. A method of controlling movement of a catheter tube through blood vessels comprising the step of selectively issuing pressurized fluid from different locations of said catheter tube to externally of said catheter tube so as to impart selective transversely-directed reactive forces to said catheter tube.

4,403,986

NEEDLE-LESS INJECTION INSTRUMENT

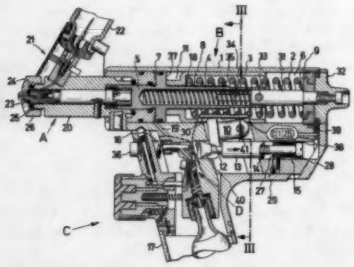
Hans-Jürgen Dettba. n, Marburg, and Josef Zimmermann, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,157

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115377

Int. Cl.³ A61M *5/30*

U.S. Cl. 604—70 **6 Claims**



1. A needle-less injection instrument with a piston pump for the medium to be injected, which is connected to a drive motor, the working piston of which is arranged displaceably in a cylindrical bore of the motor housing, wherein the drive motor (B) has a spring housing (3) which is secured against rotation and in which is located a working spring (2) which is supported at one end on a supporting face (18) in the spring housing (3) and at the other end on an end face (9) limiting the bore (6) in the motor housing (1) and is guided by a part of the working piston (5) which is designed as a piston rod (4) and which is provided with a crank and a thread (8) engaging with a corresponding thread in the spring housing (3).

4,403,987

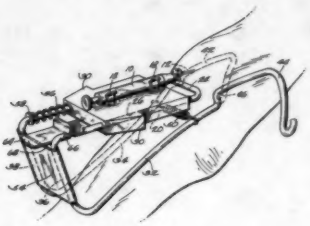
DEVICE FOR AIDING INJECTION OF A HYPODERMIC SYRINGE

John G. Gottinger, Fond du Lac, Wis., assignor to Gottinger Company, Inc., Fond du Lac, Wis.

Filed Jan. 25, 1982, Ser. No. 342,150

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—115 **12 Claims**



1. Apparatus for supporting a hypodermic syringe to facilitate injection of the needle of the hypodermic syringe into a limb, the apparatus comprising

a syringe supporting member having a syringe supporting surface adapted to support a syringe,

guide means for supporting the syringe supporting member for movement between a first position wherein the needle of the syringe is retracted from the limb and an injecting position, said means for supporting including a pair of guide rods for supporting said syringe supporting member for slideable movement between said first position and said injecting position, and

means for supporting said guide means on the limb and for pinching the flesh adjacent the syringe needle, said means for supporting said guide means including a pair of spaced apart generally parallel support rods having rearward ends adapted to rest on the limb and being integrally joined to said guide means, and said support rods including forward ends for pinching flesh therebetween to cause the flesh adjacent the syringe needle to pucker, and spring means for resiliently biasing said forward ends of said support rods together so as to cause said support rods to pinch the flesh therebetween.

4,403,988

SYRINGE ASSEMBLY

William J. Binard; Anthony J. Ciarico, both of Cary; Leonard R. Anglada, Arlington Heights, and Bhupendra C. Patel, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 180,071, Aug. 21, 1980, Pat. No. 4,284,084, which is a division of Ser. No. 53,482, Jun. 29, 1979, Pat. No. 4,240,430, which is a continuation of Ser. No. 853,962, Nov. 22, 1977, abandoned, which is a division of Ser. No. 776,147, Mar. 10, 1977, Pat. No. 4,074,714, which is a division of Ser. No. 702,164, Jul. 2, 1976, Pat. No. 4,030,497, which is a division of Ser. No. 627,982, Nov. 3, 1975, Pat. No. 4,000,741, which is a continuation-in-part of Ser. No. 509,757, Sep. 27, 1974, abandoned. This application Apr. 1, 1981, Ser. No. 249,600

Int. Cl.³ A61M *5/00*

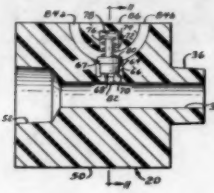
U.S. Cl. 604—118 **3 Claims**

1. A syringe assembly, comprising:

a barrel having a chamber for retaining fluid;

a plunger having one end received in the chamber for pumping fluid out of the chamber;

extension means having a passageway extending through the extension means and communicating with the syringe chamber; and



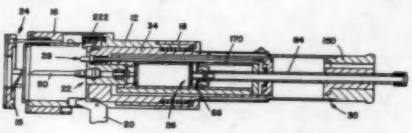
valve means associated with the extension means and communicating with said passageway, said valve means actuating at a predetermined pressure to relieve pressure in the passageway.

4,403,989

INJECTION DEVICE

Terrence B. Christensen; Allen D. McNaughton, both of Mountain View, and Steven R. Umbach, Menlo Park, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 14, 1981, Ser. No. 301,661
Int. Cl.³ A61M 5/00
U.S. Cl. 604—137 **42 Claims**



1. An injection device for injecting a host at an injection surface thereon comprising:

a base having a forward end and a rearward end;

needle carrying means supported on said base and operable to move a needle from a first, retracted position to a second, extended position relative to said forward end of said base; and

needle actuation means, operatively coupled to said needle carrying means and responsive to the orientation of said needle carrying means and the injection surface of the host, said needle actuation means being operative to permit movement of said needle carrying means from said first position to said second position only when said needle carrying means and the injection surface of the host are in a preferred orientation relative to each other.

4,403,990

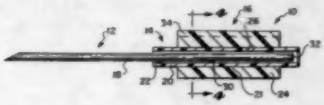
SUPPORT ASSEMBLY FOR A CANNULA AND THE LIKE

Edward B. Garver, Sr., Lindenhurst, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,736
Int. Cl.³ A61M 5/00
U.S. Cl. 604—273 **6 Claims**

1. An autoclavable hub assembly for supporting a cannula comprising

a first member made of a thermoplastic material consisting essentially of a combination of first and second polymers, said first polymer being present in an amount of from about 50% to about 70% by combined weight of said first and second polymers and being an autoclavable thermoplastic copolyester material, said second polymer being present in an amount of from about 30% to about 50% by combined weight of said first and second polymers and being a nonautoclavable amorphous thermoplastic copolyester material based on polyethylene terephthalate, said combination being autoclavable and bondable to the cannula in response to exposure to heat which emanates from the cannula and which exceeds the temperature sufficient to sterilize the cannula and said first member, said first member including an open interior having a normal configuration which, prior to said exposure to



heat, slidingly receives the cannula and which, during said exposure to heat, is deformable about the cannula, and

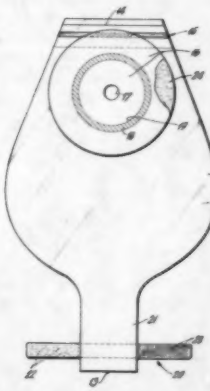
a second member made of an elastomeric material which is not heat deformable during said exposure to heat and which includes means for supporting said first member in an interference fit relationship within said second member and for deforming said first member during said exposure to heat to alter said normal configuration into a thermally bonded conformance fit configuration about the cannula.

4,403,991

CLOSURES FOR OPEN ENDED OSTOMY POUCH

John A. Hill, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 851,099, Nov. 14, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,895
Int. Cl.³ A61F 5/44
U.S. Cl. 604—337 **4 Claims**



1. An ostomy appliance comprising a generally pear shaped pouch formed from two polymeric film surfaces permanently bonded along a majority of their length, each of said pouch polymeric film surfaces being a laminate of about 3 mils thickness of an outer and inner layer of ethylene vinyl acetate having a core of a copolymer of vinyl chloride and polyvinylidene chloride, one of said polymeric film surfaces being the skin side of said pouch and having an opening which fits around the stoma, the other polymeric film surface being the outer side of said pouch, a faceplate permanently bonded to the skin side of the pouch around said stomal opening, said faceplate having a centrally located opening which is expanded to fit the appliance snugly around the stoma and comprises a thin disk shaped film of polymeric material of from about 2 to 8 mils thickness

having an adhesive composition which includes a pressure sensitive adhesive component and one or more hydrocolloids on its exposed surface and wherein the bond between said disk shaped film and said skin side of the pouch does not extend to the outer peripheral edge of said faceplate, said pouch including a narrow tail portion having an open bottom through which the contents of said pouch can be drained, and resealable bottom closure means comprising a semi-rigid folding bar of high density polyethylene of about 5 mils thickness permanently attached to the outer side of said pouch at the narrow tail portion near said bottom opening, said folding bar extending traversely across and beyond the width of said pouch tail portion and having interlocking closure elements on said extended portions of said folding bar wherein said interlocking closure elements are a section of male hook elements attached to the skin side of one extending portion of said folding bar and a section of female loop elements attached to the outer side of the other extended portion of said folding bar and wherein said bottom opening is sealed by rolling the tail portion of said pouch over said folding bar and bending the extended portions of said folding bar so that said male hook and female loop elements can be pressed together.

4,403,992

CONTINUOUS PERITONEAL DIALYSIS BAG DEVICE

Gianfranco Bertellini, Maslianico, and Luigi Fabbri, Bologna, both of Italy, assignors to Sis-Ter S.p.A., Pignano, Italy

Filed Oct. 1, 1981, Ser. No. 307,386

Claims priority, application Italy, Oct. 6, 1980, 25139 A/80

Int. Cl.³ A61M *5/14, 1/03*

U.S. Cl. 604—410 **12 Claims**

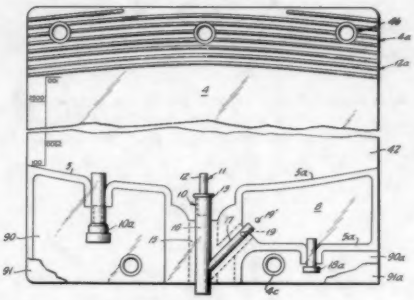
1. Continuous peritoneal dialysis bag, adapted for connection to a catheter associated with the abdominal cavity of a patient, comprising

a flexible bag (**4**) of heat soluble flexible plastic material, formed of two parallel plastic walls (**40**, **41**) secured together at heat weld connection lines (**4***a*, **5**, **5***a*) to define therebetween a plurality of chambers (**42**, **8**) and communication ducts (**16**, **17**) sealed into said connection lines to provide for fluid communication with the chambers,

wherein a first heat weld connection line (**5**) extends essentially transversely across the bag to define a dialysis fluid chamber (**42**) in the bag, and a second heat weld connection line (**5***a*) is spaced from said first connection line to define a disinfectant chamber (**8**) in the bag;

a first one (**16**) of the communication ducts extending from the dialysis fluid chamber (**42**) to the outside thereof;

a second one of the communication ducts (**17**) extending from the disinfectant chamber (**8**) and merging into the first communication duct (**16**), to permit injection of disinfectant fluid from the disinfectant chamber into the first communication duct for fluid delivery from the dialysis chamber;



a third communication duct (**10***a*) extending from the outside of the bag into the dialysis chamber (**42**);

a first manually releasable closure means (**12**, **13**) closing off the inside of said first communication duct (**16**) within said dialysis fluid chamber (**42**);

a second releasable closure means (**19**) closing off the inside of said second communication duct (**17**) located within the disinfectant chamber;

and externally accessible closing means closing the third communication duct (**10***a*).

4,403,993

PREPARATION OF WATER-SOLUBLE OR SELF-DISPERSING RESIN TANNING AGENTS

Dietrich Lach, Friedelsheim; Rolf Streicher, Worms, and Gerhard Bolz, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 367,015

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115646

Int. Cl.³ C14C *3/18*

U.S. Cl. 8—94.24 **10 Claims**

1. A process for preparing a water-soluble or self-dispersing tanning agent by heating from 5 to 30% by weight of melamine, from 15 to 45% by weight of urea, from 20 to 35% by weight (calculated as anhydrous material) of formaldehyde and from 15 to 55% by weight of sodium bisulfite or of a corresponding amount of some other salt of sulfurous acid for from two to twelve hours in aqueous solution at 40°–120° C. and a pH of from 5 to 9.

4,403,994

BLEACHING AGENTS

Geoffrey J. Hignett, Lymm, England, assignor to Interox Chemicals Limited, England

Division of Ser. No. 193,078, Oct. 2, 1980, Pat. No. 4,385,008. This application Sep. 7, 1982, Ser. No. 415,725

Claims priority, application United Kingdom, Oct. 18, 1979, 7936178; Dec. 22, 1979, 7944312

Int. Cl.³ D06L *3/02*; C11D *3/395, 7/54*

U.S. Cl. 8—111 **6 Claims**

1. Desensitised bleaching compositions comprising a magnesium salt of a compound selected from the group consisting of Class (1)-an aromatic carbocyclic compound substituted around the aromatic nucleus by a carboxylate group and a peroxycarboxylic acid group both groups being derivable from the corresponding aromatic carbocyclic anhydride by reaction with hydrogen peroxide, said aromatic carboxylic compound optionally being further substituted by at least one of the groups selected from alkyl, carboxylate, sulphonate, nitro, chloro and bromo groups or Class (2)-a cycloaliphatic compound substituted around the cycloaliphatic nucleus by a carboxylate group and a peroxycarboxylic acid group both groups being derivable from the corresponding cycloaliphatic carbocyclic anhydride by reaction with hydrogen peroxide, said cycloaliphatic carboxylic compound optionally being further substituted by at least one of the groups selected from alkyl, carboxylate, sulphonate, nitro, chloro and bromo groups or Class (3)-compounds other than those in Class 1 in which the carbonyl group of the peroxycarboxylic acid substituent is conjugated with the carbonyl group of a carboxylate substituent via olefinic unsaturation which carboxylate and peroxycarboxylic acid substituents are derivable from the corresponding anhydride by reaction with hydrogen peroxide in intimate mixture with a desenitising amount of one or more desensitising diluents.

4,403,995

SULPHUR DYESTUFFS, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE FROM HYDROXY-DIPHENYLAMINE COMPOUNDS

Dieter Cornelius, Darmstadt, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

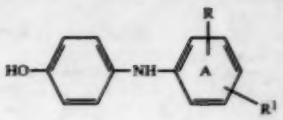
Filed Feb. 18, 1982, Ser. No. 350,116

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114033

Int. Cl.³ C09B *49/10*; D06P *1/30*

U.S. Cl. 8—652 **9 Claims**

1. Sulphur dyestuff prepared by first producing a thiazine by reacting sulphur with a 4-hydroxydiphenylamine of the formula



at a temperature from 160° to 190° C. with a molar ratio of 4-hydroxydiphenylamine to sulphur being from 1:(2 to 2.4) and wherein R and R^1 are hydrogen or alkyl having 1 to 4 carbon atoms and the ring nucleus A has at least one free ortho-position in relation to the imino moiety,

and then sulphurizing said thiazine compound in a water-soluble solvent at a temperature from 130° to 150° C. to produce the sulphur dyestuff.

4,403,996

METHOD OF PROCESSING LOW RANK COAL

Yoshio Matsuura, Funabashi; Michio Kurihara, Mitaka; Takao Kamei, Ashiya; Akira Nakamura; Keiichi Komai, both of Akashi, and Takeshi Wakabayashi, Kobe, all of Japan, assignors to Electric Power Development Co., Tokyo and Kawasaki Jukogyo Kabushiki Kaisha, Kobe, both of, Japan

Filed Feb. 10, 1982, Ser. No. 347,466

Int. Cl.³ C10L *9/08, 5/32, 1/32*

U.S. Cl. 44—1 G **5 Claims**

1. Method of processing low rank coal which comprises steps of classifying crushed low rank coals, on the basis of a particle-size borderline point for separation on the order of millimeters, into coal-rich middle sized lumps and minute particles containing ash content at a rate greater than that of the ash content of the coal-rich middle sized lumps, subjecting the middle size lumps to a non-evaporating dehydration treatment to produce low moisture content coals, separating ash content from the minute particles and then at least partly liquefying the minute particles to produce liquefied oil, and mixing the liquefied oil with the low moisture content coals to thereby produce a mixture of low-moisture coal and oil.

2. Method in accordance with claim 1 in which the low rank coal is brown coal.

5. Method in accordance with claim 1 in which the mixture is oil coated coal.

4,403,997

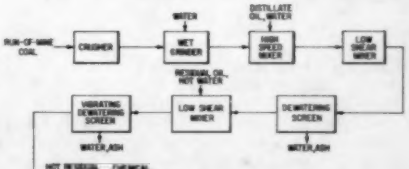
APPARATUS FOR MANUFACTURING FLUID COAL-OIL-WATER FUEL MIXTURE

Leonard E. Poetschke, Chester Basin, Canada, assignor to Scotia Recovery Systems Limited, Halifax, Canada

Continuation-in-part of Ser. No. 249,918, Apr. 1, 1981. This application Dec. 28, 1981, Ser. No. 334,538

Int. Cl.³ C10L *11/08, 1/32*

U.S. Cl. 44—2 **11 Claims**



1. Apparatus for manufacturing a coal-oil-water mixture for use as a fuel comprising

(a) a grinder for grinding coal to a relatively fine particle size;
(b) a mixer for mixing said coal particles with water and distillate oil;
(c) sub-apparatus for assisting in the formation of coal-oil-water agglomerates and the removal of ash and excess water, including a high shear mixture to assist in the formation of said agglomerates and a first screen for removing some of said ash and excess water; and
(d) a sonic agitator to stabilize the coal-oil-water mixture.

3. The apparatus of claim 1 wherein said grinder is capable of grinding said coal to an average particle size of less than 100 microns, said high molecular weight organic compound is contained in a heavy residual oil containing paraffinic fractions and said sonic agitator operates at less than 20,000 cycles per second.

4,403,998

PROCESS FOR PREPARING COAL SUSPENSIONS

Johann G. D. Schulz, Pittsburgh, and John A. Cobler, Harwick, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 24, 1981, Ser. No. 334,159
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—51 **17 Claims**

1. A process for preparing coal suspensions which comprises contacting coal with nitric acid and then mixing said contacted coal with an aqueous base solution.

4,403,999

PROCESS FOR PRODUCING OXYGENATED FUELS

Susan A. Bezman, Point Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 25, 1981, Ser. No. 277,439
Int. Cl.³ C10L *1/02, 1/18*
U.S. Cl. 44—56 **7 Claims**

1. A process for the production of an oxygenated fuel composition comprising:
(a) reacting a feedstock comprising propylene with water in the presence of a cation exchange catalyst under direct hydration conditions;
(b) separating the resulting product into a first stream comprising isopropanol and water and a second stream comprising propylene;
(c) contacting the second stream with an acid catalyst under oligomerization conditions in a second reaction zone to form an olefinic gasoline blending stock;
(d) distilling the first stream to produce a third stream consisting essentially of a water-isopropanol azeotrope;
(e) mixing the third stream at atmospheric pressure and ambient temperature with a fourth stream consisting essentially of a gasoline blending hydrocarbon stream;
(f) passing the resulting mixture through water coalescer means to rapidly coalesce water out of the mixture; and
(g) recovering an organic phase which is an oxygenated fuel composition comprising an isopropanol-containing gasoline blending hydrocarbon stream.

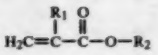
4,404,000

MIDDLE AND/OR HEAVY DISTILLATE COMPOSITION HAVING GOOD FLOW PROPERTY AND FILTERABILITY

Yoshiki Toyoshima; Sumio Hara, both of Niihama, and Masaki Nakazyo, Saijo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 26, 1982, Ser. No. 411,807
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—62 **2 Claims**

1. A middle and/or heavy distillate composition comprising a fuel oil of varying proportions of middle and/or heavy distillate of petroleum and 10–2000 ppm, based on the fuel oil, of a mixture of 1–99% by weight of (A) a copolymer of ethylene with an alkoxyalkyl acrylate or methacrylate represented by the formula,



wherein R_1 represents hydrogen or C_1–C_2 alkyl and R is $-C_mH_{2m}$-O-C_nH_{2n+1}, m and n each being an integer of 1–4, and 99–1% by weight of (B) a copolymer of ethylene with a vinyl ester of saturated carboxylic acid and/or an alkyl ester of ethylenic unsaturated carboxylic acid.

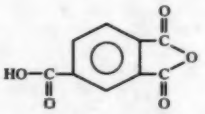
4,404,001

DETERGENT AND CORROSION INHIBITOR AND MOTOR FUEL COMPOSITION CONTAINING SAME

Benjamin J. Kaufman, Wappingers Falls; Sheldon Herbstman, Spring Valley, and Mark Levin, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,270
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—63 **10 Claims**

1. As a detergent and corrosion inhibiting fuel additive the reaction product obtained by reacting an N-C_{10} to C_{25}-hydrocarbyl-1,3-diaminopropane with trimellitic anhydride of the formula:



wherein the ratio of said diaminopropane to said trimellitic anhydride ranges from about 1.5:1 to about 2.5:1.

4,404,002

ZIRCONIUM ADDITIVES FOR RESIDUAL FUEL OIL

Nicholas Feldman, Woodbridge, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 296,016, Aug. 25, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 405,871
Int. Cl.³ C10L *1/30*
U.S. Cl. 44—68 **15 Claims**

1. A process for reducing the amount of particulate matter formed during the combustion of a residual fuel oil which comprises combusting a residual fuel oil which contains an effective trace amount of an additive selected from the group consisting of:
(i) an oil soluble zirconium salt of an alcohol or phenol having the formula:

ROH

where R is a hydrocarbyl group of 2 to 24 carbon atoms; or
(ii) an oil soluble zirconium salt of a sulfonic acid having the formula:

RSO_3H

where R is an alkyl, cycloalkyl, aryl, alkaryl or aralkyl group and said salt has a molecular weight of about 100 to about 2500; said amount being effective in reducing the amount of particulate matter formed during combustion.

4,404,003

MICROWAVE HEATING PROCESS FOR GRINDING WHEELS

Denis I. Harris, Nazeing, England, assignor to Norton Company, Worcester, Mass.

Filed Oct. 16, 1981, Ser. No. 312,061

Claims priority, application United Kingdom, Jul. 15, 1981, 8121831

Int. Cl.³ C09K 3/14

U.S. Cl. 51—298 13 Claims

1. A method for making a low porosity resin bonded product that contains abrasive grains, comprising mixing the grains with a powdered resin bonding composition, heating the resin in the mix by a dielectric heating field to soften at least part of the resin the maximum temperature achieved by the resin portion being below that at which significant curing takes place, cold pressing the preheated mix in a mould to produce a dense shape, removing the pressure and subsequently curing the resin in the compressed mix to form the bonded product.

4,404,004

METHOD FOR SEPARATING GAS MIXTURES BY MEANS OF PRESSURE CHANGING ADSORPTION TECHNIQUE

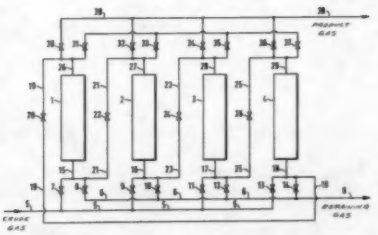
Karl Knoblauch; Ekkehard Richter, both of Essen; Klaus Giessler, Gelsenkirchen, and Werner Körbächer, Mühlheim, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,157

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 8122701

Int. Cl.³ B01D 53/04

U.S. Cl. 55—25 5 Claims



1. A method using pressure adsorption technique for separating individual gas components from gas mixtures or adsorption agents in which a gas mixture is fed under increased pressure onto an adsorption agent layer in a separation reactor wherein undesirable gas components are adsorbed and thereafter the product gas is discharged whereby a subsequent build up of pressure to adsorption pressure takes place in the layer by gas flow in reverse direction with respect to the adsorption direction followed by a subsequent adsorption stage which comprising:

(a) causing the pressure release and rinsing action to occur in two stages using reverse direction of flow with respect to the direction of adsorption;

(b) using the relief gas obtained from the first reverse flow pressure relief stage as a rinsing gas for the first rinsing stage;

(c) discharging the relief gas obtained from the second reverse flow pressure relief stage as a remainder gas; and

(d) using the product gas as a rinsing gas for the second rinsing stage.

4,404,005

MOLECULAR SIEVE TYPE GAS SEPARATION SYSTEMS

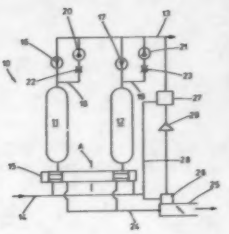
Humphrey A. S. Hamlin, Montacute, near Yeovil, and James C. Taylor, Yeovil, both of England, assignors to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Aug. 18, 1981, Ser. No. 294,004

Claims priority, application United Kingdom, Aug. 18, 1980, 8026843

Int. Cl.³ B01D 53/04

U.S. Cl. 55—163 5 Claims



1. A molecular sieve type gas separation system comprising:

a plurality of interconnected beds containing adsorptive material for retaining at least one constituent of a gaseous mixture supplied to the system to produce a product gas;

a control means for operating each said bed in a relatively phased cycle having a period of adsorption and a period of regeneration, said control means including

an inlet valve means for passing the gaseous mixture into each said bed sequentially,

back-flush valve means for passing a portion of the product gas delivered by an adsorping bed to back-flush another bed for desorption or regeneration of said another bed,

an adjustable vent valve means for discharging of the back-flushing gas from said another bed, and

a sensing means for monitoring a physical paramenter of the system gases and for precisely controlling said vent valve means to adjustably regulate the regenerating gas flow therethrough and hence the advance of the retained constituent in said another bed during regeneration thereof so that when said another bed is in a period of adsorption a product gas having an average concentration level of a chosen value is produced and only that amount of product gas necessary to back-flush said another bed for the desired position of the retained constituent is lost during regenerating of said another bed.

4,404,006

FILTER DEVICE

Charles D. Williams, 31 Harbor Site Dr., Rolling Hills Estate, Calif. 90274, and Knut H. Larsen, 7878 S. Poplar, Englewood, Colo. 80112

Filed Jun. 19, 1981, Ser. No. 275,279

Int. Cl.³ B01D 46/10

U.S. Cl. 55—502 6 Claims

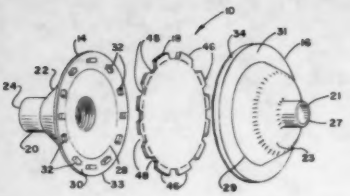
1. A filter device comprising:

a first housing having gas inlet means and a plurality of spaced ribs extending from a surface of said first housing, each of said ribs positioned on the periphery of said surface of said first housing;

a filter having a plurality of peripherally located projections which define open spaces therebetween, said open spaces being in alignment with said ribs; and

a second housing having gas outlet means and being joined to said first housing with said filter being positioned between said first housing and said second housing said second housing being joined to said first housing by said

ribs being fused so that at least portions of said ribs flow through said open spaces to said second housing and seals



said first and second housings and the pheriphery of said filter together.

4,404,007

EXHAUST GAS CLEANING ELEMENT

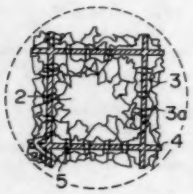
Toshiyuki Tukao, Okazaki, and Masahiro Tomita, Anjo, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 8, 1981, Ser. No. 328,797

Claims priority, application Japan, Dec. 11, 1980, 55-175464; Dec. 11, 1980, 55-175465; Mar. 30, 1981, 56-46756; Apr. 20, 1981, 56-60481; Jul. 16, 1981, 56-111633

Int. Cl.³ B01D *39/20;* **C04B** *21/06*

U.S. Cl. 55—523 **4 Claims**



1. A rigid ceramic element adapted for capturing and retaining carbon from the exhaust gas of a diesel engine, said element comprising a ceramic monolithic honeycomb structure having inner wall surfaces defining a plurality of cells extending throughout the length of said element, each cell having an open inlet end and an open outlet end defining therebetween a passageway through which said exhaust gas flows, and an irregular reticulate ceramic layer coated upon said inner wall surfaces defining each of said cells, said ceramic layer including a multiplicity of irregularly arranged projections extending into said exhaust gas passageway so as to disturb the exhaust gas flow therethrough to activate the interaction between the exhaust gas and said inner wall surfaces to enhance the capturing and retaining of carbon from the exhaust gas.

4,404,008

COMBINED CASCADE AND MULTICOMPONENT REFRIGERATION METHOD WITH REFRIGERANT INTERCOOLING

Robert J. Rentler, Macungie, Pa., and David D. Sproul, Houston, Tex., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 18, 1982, Ser. No. 349,786

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—11 **7 Claims**

1. A method for cooling and liquefying a methane-rich gas stream which is at superatmospheric pressure comprising the steps of:

(a) initially cooling the methane-rich gas stream in a series of staged heat exchangers with a single component refrigerant,

(b) cooling and partially liquefying a pressurized multicomponent refrigerant in a series of staged heat exchangers with said single component refrigerant,

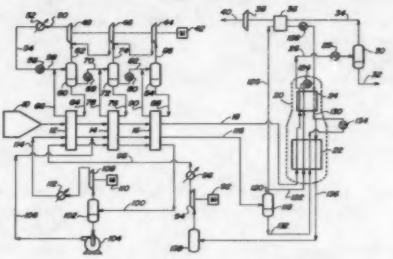
(c) separating the gas and liquid phases of the cooled multicomponent refrigerant,

(d) liquefying and subcooling said methane-rich gas stream in a series of heat exchangers with the gas phase and the liquid phase of said multicomponent refrigerant,

(e) recompressing said single component refrigerant in a series of staged compressions,

(f) aftercooling said compressed single component refrigerant against a non-hydrocarbon cooling fluid,

(g) initially recompressing said multicomponent refrigerant and aftercooling said refrigerant against a non-hydrocarbon cooling fluid,



(h) interstage cooling of said multicomponent refrigerant in a series of heat exchangers against the single component refrigerant to form a two phase multicomponent stream,

(i) compressing the gas phase of the multicomponent refrigerant and aftercooling the compressed refrigerant against a non-hydrocarbon cooling fluid before further cooling against the single component refrigerant,

(j) pumping the liquid phase of the multicomponent refrigerant to a pressure equal to the gas phase of step (i),

(k) combining the multicomponent refrigerant streams of step (i) and step (j) for further cooling as performed in step (b) above.

4,404,009

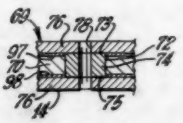
METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Mohinder S. Bhatti; Alfred Marzocchi, and George W. Ritter, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 22, 1982, Ser. No. 452,274

Int. Cl.³ C03B *37/025*

U.S. Cl. 65—1 **10 Claims**



1. A feeder for supplying streams of glass to be drawn into filaments having an orificed wall comprising:

a refractory metal layer;

an oxygen impervious, precious metal layer;

a barrier layer located between said refractory metal layer and said precious metal layer, said layers being intimately bonded together by hot isostatic pressing to form a unitary laminate, said barrier layer substantially retarding the interdiffusion of the refractory metal and precious metal; said refractory metal or precious metal not forming a compound with said barrier layer having a melting point temperature

less than the temperature of the molten glass in contact with said laminate; said laminate having at least one aperture therethrough; and

an orificed element positioned in said aperture to prevent the oxidation of said refractory metal layer at elevated temperatures and to establish said streams of glass.

4,404,010

REPLACING OPTICAL FIBRE SHEATHING AFTER FUSION SPLICING

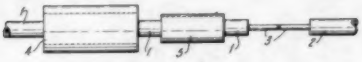
Terry Bricheno, Near Bishop's Stortford; Alexander J. Robertson, Hoddesdon, and Ross K. Finlay, Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,704

Claims priority, application United Kingdom, Nov. 14, 1980, 8036717

Int. Cl.³ G02B *5/14*; B29D *11/00*

U.S. Cl. 65—4.2 **9 Claims**



1. A method of forming a flexible splice between the ends of a pair of thermoplastic sheathed glass optical fibres comprising the steps of:

stripping a length of sheathing from one end of each of the two optical fibres;

forming a fusion splice between the sheathing stripped lengths of said fibres;

positioning a quantity of thermoplastic material of the type used for the sheathing around the entire circumference of the sheathing-stripped lengths, the volume of the quantity of said thermoplastic material being substantially equal to the volume of sheathing stripped from said lengths;

positioning a length of heat-shrinkable tubing around said quantity of thermoplastic material to contain and mold said material;

fusing said thermoplastic material to the ends of the unstripped sheathing of the two fibres to form a replacement length of sheathing having a diameter substantially equal to the diameter of the unstripped sheathing; and

removing said heat-shrinkable tubing.

4,404,011

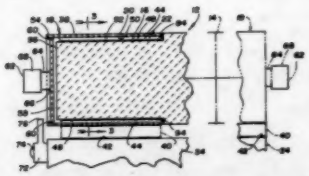
CONVEYOR ROLL END CAP

Ronald A. McMaster, 420 Water St., Woodville, Ohio 43469

Filed Jan. 6, 1981, Ser. No. 222,853

Int. Cl.³ C03B *35/18*

U.S. Cl. 65—181 **10 Claims**



1. A hot glass sheet conveyor roll made of thermally low expansive ceramic with an elongated shape including an intermediate conveying portion of a round cross-section and also including at least one end with an end cap comprising: a metal sleeve that receives the end of the roll to provide rotational support thereof; and a retention spring interposed between and engaged with both the end of the roll and the sleeve of the end cap to retain the sleeve on the roll end, and said retention spring having a sufficiently deflected condition at room temperature such that upon heating of the roll and its end cap the retention spring remains partially deflected in engagement with both the roll end and the end cap sleeve whereby the retention spring retains the end cap on the roll end and prevents relative rotation between the end cap and the roll end.

4,404,012

PROCESS FOR INCREASING SUGAR YIELD IN SUGARCANE

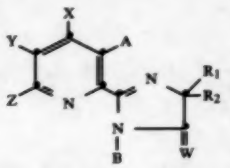
Philip L. Orwick, Morrisville, Pa., and Andrew R. Templeton, West Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 155,900, Jun. 2, 1980, abandoned. This application Apr. 20, 1981, Ser. No. 255,937

Int. Cl.³ A01N *43/42*

U.S. Cl. 71—92 **7 Claims**

1. A method for increasing sucrose yields from sugarcane comprising applying to the foliage of said sugarcane about 2 weeks to 4 weeks prior to first harvest an effective amount of a compound having the formula:



(I)

wherein

R_1 is C_1–C_3 alkyl;

R_2 is C_1–C_2 alkyl;

A is $COOR_3$;

R_3 is hydrogen, methyl or furfuryl;

C_3alkynyl; or,

A cation of alkali metals, alkaline earth metals, ammonium or organic ammonium;

B is H;

W is O;

X and Y are hydrogen;

Z is hydrogen chlorine or methyl; the optical isomers thereof, or except when R_3 is a salt-forming cation, the acid addition salts thereof.

4,404,013

PLANT GROWTH MEDIUM

Arnold Rainbow, Ipswich, England, assignor to Fisons Limited, England

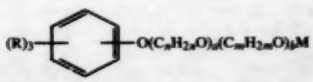
Continuation of Ser. No. 167,685, Jul. 11, 1980, abandoned. This application Apr. 13, 1982, Ser. No. 368,008

Claims priority, application United Kingdom, Jul. 17, 1979, 7924910

Int. Cl.³ C05F *11/02*

U.S. Cl. 71—24 **5 Claims**

1. A composition comprising peat and 0.01 to 2% by weight, based on the dry peat solids, of a wetting agent having the formula:



I

wherein each R is selected from an alkyl group containing from 1 to 12 carbon atoms; n and m each has a value selected from 2 and 3; the sum a+b is at least 1 and at least one of a and b has a value of at least 1; and M is selected from hydrogen, ammonium and alkali metal; and mineral acid esters thereof.

4,404,014

SALT-LIKE PRODUCTS OF THE ADDITION OF PHENOLS ONTO AMINO ORGANOSILANE ESTERS AND METHOD FOR THE PREPARATION THEREOF AND USE AS A PRESERVATIVE

Hans-Joachim Kötzsch, and Hans-Joachim Vahlensieck, both of Rheinfelden, Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

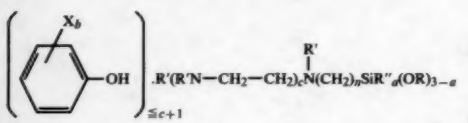
Division of Ser. No. 90,725, Nov. 2, 1979, Pat. No. 4,254,270. This application Jul. 30, 1980, Ser. No. 173,543

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847400

Int. Cl.³ A01N *31/08, 55/00*

U.S. Cl. 71—67 46 Claims

1. A process for preserving a material against biological attack and/or biological infection and/or biological infestation caused by fungi, bacteria, viruses, microphytes (e.g., algae), insects and other microorganisms which comprises applying thereto an effective amount of an adduct of phenol with an aminoorganosilane ester with salt-like charge-transfer-complex structure of the general formula



wherein

R represents an alkyl moiety of 1 to 8 carbon atoms or ethylene glycol or propylene glycol or up to 3 polyethylene or polypropylene glycol moieties terminally closed with a lower alkyl or acyl group of a lower alkanoic acid;

R′ represents hydrogen or alkyl moieties having 1 to 20 carbon atoms optionally containing one or more ether bridges or a cyclohexyl moiety;

R″ represents alkyl with 1 to 8 carbon atoms;

X represents halogen or C_{1-4} alkyl moieties or a nitro group;

a being a value of 0 to 3;

b a value of 0 to 5;

c a value of 0 to 20; and

n a value of 1 to 6.

4,404,015

PREPARATION OF MATERIAL USEFUL AS PLANT NUTRIENTS

Kuruvakkat K. G. Menon; Hariharan Raman; Vadali S. Sarma, and Bookinkere C. Subba, all of Maharashtra, India, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 8, 1981, Ser. No. 281,531

Claims priority, application United Kingdom, Jul. 18, 1980, 8023593

Int. Cl.³ A01N *27/00*

U.S. Cl. 71—77 9 Claims

1. A process for the preparation of an aqueous composition useful as a plant growth stimulant, which process comprises the steps of:

(a) saponifying a plant wax selected from the group consisting of rice bran wax and carnauba wax to obtain a mixture of saponified and unsaponified material;

(b) recovering unsaponified material from the mixture by extraction with a water-immiscible organic solvent; and

(c) mixing the recovered unsaponified material with water and one or more emulsifying agents.

4,404,016

COMPOSITION AND METHOD FOR CONTROLLING GROWTH OF TOBACCO SUCKERS

Thomas C. Zinninger, and Joseph Deli, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 28, 1981, Ser. No. 306,055

Int. Cl.³ A01N *37/12, 31/02, 43/58*

U.S. Cl. 71—78 4 Claims

1. In a method of controlling the growth of suckers on tobacco plants by sequentially treating the plants with one or more applications of C_6 to C_{18} saturated fatty alcohol followed by one or more applications of maleic hydrazide wherein the improvement resides in applying to the topped plants, following application of either said fatty alcohol or maleic hydrazide, an effective sucker controlling amount of a solution of isopropyl N-(3 chlorophenyl) carbamate in alkylene glycol so as to provide from about 10 to about 200 milligrams of carbamate compound per tobacco plant.

4,404,017

PHTHALIMIDOGUANIDINE PLANT GROWTH REGULATORS

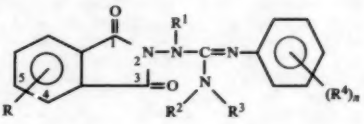
Jerry L. Rutter, Mentor, Ohio, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 3, 1980, Ser. No. 165,917

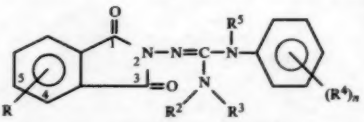
Int. Cl.³ A01N *43/38, 43/40, 43/84, 47/44*

U.S. Cl. 71—88 11 Claims

1. The method of regulating the growth of plants comprising applying to the plants, the seed or the soil an effective amount of a compound having one of the following structural formulas;



(1a)



(1b)

in which R, R^1 and R^5 are hydrogen or C_1 to C_5 alkyl, R^2 and R^3 are alike or unlike, one of which may be hydrogen but otherwise are substituents selected from branched or unbranched C_1 to C_5 alkyl, alkenyl, alkynyl, C_2 to C_5 hydroxyalkyl or alkoxyalkyl, C_3 to C_5 cycloalkyl, furfuryl, pyridyl, benzyl, phenyl, C_1 to C_5 alkyl-substituted phenyl, or $—NR^2R^3$ together may be 2,5-dimethyl-1-pyrryl, 4-morpholinyl, or 1-pyrrolidinyl, R^4 is halogen, nitro, cyano, trifluoromethyl or C_1 to C_5 alkyl and n is zero, one or two.

4,404,018

FURFURYL AMIDES OF PHENOXYPHENOXYALKANOIC ACIDS AND HERBICIDAL USE

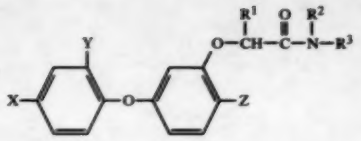
Leonard J. Stach, Riverside, and Takeo Hokama, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 23, 1982, Ser. No. 391,088

Int. Cl.³ A01N *43/08;* C07D *307/16, 307/54*

U.S. Cl. 71—88 10 Claims

1. A compound of the formula



(I)

wherein X is halogen or trifluoromethyl; Y is selected from the group consisting of hydrogen, halogen, nitro and cyano; Z is selected from the group consisting of nitro, cyano and halogen; R^1 is alkyl; R^2 is hydrogen or alkyl; and R^3 is furfuryl or tetrahydrofurfuryl.

9. A herbicidal composition comprising an inert carrier and as the essential active ingredient, in a quantity toxic to weeds, a compound of claim **1**.

4,404,019

3-CHLORO-1-PHENYL-1,2,4-TRIAZOLIN-5-ONES AND THEIR USE AS HERBICIDES

Tamon Uematsu, Funabashi; Shunichi Hashimoto, and Hiroshi Matsumoto, both of Sonehigashi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

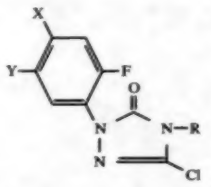
Filed Dec. 8, 1981, Ser. No. 328,719

Claims priority, application Japan, Dec. 24, 1980, 55-184515; Dec. 24, 1980, 55-184516

Int. Cl.³ A01N *43/64;* **C07D** *249/12*

U.S. Cl. 71—92 **8 Claims**

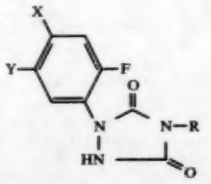
1. A compound of the formula:



wherein R is a C_1–C_4 alkyl group, a C_3–C_4 alkenyl group or a C_3–C_4 cycloalkyl group, X is a chlorine atom or a bromine atom and Y is a hydrogen atom or a C_1–C_4 alkoxy group.

7. A method for controlling weeds which comprises applying a herbicidally effective amount of the compound according to claim **1** to the locus where the control of undesired weeds is encouraged.

8. A compound of the formula:



wherein R is a C_1–C_4 alkyl group, a C_3–C_4 alkenyl group or a C_3–C_4 cycloalkyl group, X is a chlorine atom or a bromine atom and Y is a hydrogen atom or a C_1–C_4 alkoxy group.

4,404,020

CERTAIN ESTERS OF 2-[(2,6-DICHLORO-3-PYRIDYL)OXY]PROPIONIC ACID, COMPOSITIONS CONTAINING SAME AND THEIR HERBICIDAL PROPERTIES

Rolf Schurter, Binningen, Switzerland; Niels Clauson-Kaas, Farum, Denmark, and Hermann Rempfler, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 36,265, May 4, 1979, abandoned, which is a continuation of Ser. No. 862,697, Dec. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 715,352, Aug. 18, 1976, abandoned. This application Nov. 20, 1981, Ser. No. 323,604

Claims priority, application Switzerland, Aug. 25, 1975, 10964/75

Int. Cl.³ C07D *213/65;* **A01N** *43/40*

U.S. Cl. 71—94 **12 Claims**

1. 2-[(2,6-dichloro-3-pyridyl)-oxy-]-propionic acid 6'-chlorohexyl ester.

7. A method for inhibiting the growth of dicotyledonous plants which comprises applying to said plants a growth inhibiting effective amount of a compound according to claim **1**.

4,404,021

HERBICIDAL α-CYANOBENZYL 3,6-DICHLORO-2-METHOXY-BENZOATE

Jerome A. Gourse, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jul. 19, 1982, Ser. No. 399,550

Int. Cl.³ A01N *37/34;* **C07C** *121/75*

U.S. Cl. 71—105 **3 Claims**

1. The composition of matter, α-cyanobenzyl-3,6-dichloro-2-methoxybenzoate.

4,404,022

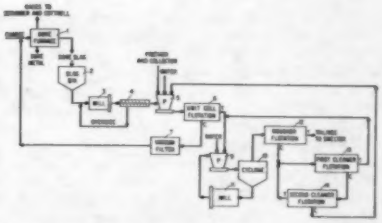
DORE SLAG TREATMENT

Peter W. Godbehere, Noranda, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Dec. 28, 1981, Ser. No. 334,897

Int. Cl.³ C22B *11/04, 1/00;* **C01G** *5/00, 7/00*

U.S. Cl. 75—2 **11 Claims**



1. A method of treating dore slag which comprises the steps of grinding the slag, mixing the obtained pulp with water to form a slurry, adding a suitable collector to the slurry for selective flotation of precious metals, adding a suitable frother, aerating the slurry to produce a precious metals concentrate in the form of a froth on top of the slurry, and separating said concentrate from the remainder of the slurry.

4,404,023

PROCESS FOR THE PRODUCTION OF A METAL OR METAL ALLOY POWDER

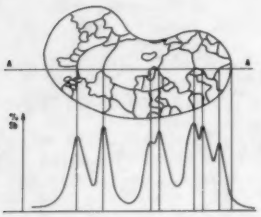
Wolfgang Glöck, Neuhaus, Fed. Rep. of Germany, assignor to Eckart-Werke Standard Bronzepulver-Werke Carl Eckart, Furth, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,572

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3113886

Int. Cl.³ B22F 9/04

U.S. Cl. 75—0.5 R 12 Claims



1. A process for the production of a metal powder having flake-like particles comprising mechanically grinding a ductile starting material and putting the material into flake form, wherein the starting material includes a foreign substance as an intermediate substance which at the temperatures occurring in the flake-forming process occurs substantially only at the boundary surfaces of the crystallites of the starting material, in order thereby to improve the crushability of the starting material.

4,404,024

PRODUCTION OF MAGNETIC POWDER

Shintaro Suzuki; Sadao Iizuka, both of Shibukawa, and Yoshimi Moriya, Gunma, all of Japan, assignors to Kaeto Denka Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 18,125, Mar. 7, 1979, Pat. No. 4,306,921. This application Mar. 24, 1981, Ser. No. 247,149

Claims priority, application Japan, Mar. 16, 1978, 53/30151

Int. Cl.³ C22C 1/04

U.S. Cl. 75—0.5 BA 18 Claims

1. A process for producing a magnetic powder consisting essentially of acicular iron particles, said particles being doped with at least one metal selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si and Al and additionally containing an applied metal selected from the group consisting of cobalt, nickel, manganese and antimony and mixtures thereof, said iron particles being suitable for magnetic recording which comprises the steps of

(a) treating finely divided starting material in the form of acicular particles selected from the group consisting of (i) a doped iron oxyhydroxide containing a doping component selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si, Al and mixtures thereof and (ii) a doped iron oxide containing a doping component selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si, Al and mixtures thereof with an aqueous solution or suspension of an applied metal compound selected from the group consisting of cobalt, nickel, manganese and antimony compounds and mixtures thereof or a mixture of said solution and said suspension so that said applied metal compound is applied on said particles,

(b) filtering said treated particles from the liquid medium to form a cake comprising said treated particles and drying said cake and

(c) reducing said dry cake in a reducing gas stream at a temperature up to 600° C. to reduce said treated particles of doped iron oxyhydroxide or doped iron oxide containing said applied metal compound whereby the individual particles are not sintered and the initial shape of the microparticles of the starting material is retained to form magnetic powder consisting essentially of acicular iron particles doped with at least one metal selected from the group consisting of Co, Mn, Ni, Ti, Bi, Mo, Ag, Cr, Zn, Si and Al.

4,404,025

PROCESS FOR MANUFACTURING SEMIFINISHED PRODUCT FROM A MEMORY ALLOY CONTAINING COPPER

Olivier Mercier; Dag Richter, both of Ennetbaden, and Günther Schröder, Birmenstorf, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Feb. 23, 1982, Ser. No. 351,530

Claims priority, application Switzerland, Mar. 13, 1981, 1728/81

Int. Cl.³ C21D 8/00

U.S. Cl. 148—11.5 F 7 Claims

1. A process for manufacturing semifinished product comprising the steps of forming a memory alloy consisting of the Ni/Ti type, containing copper, starting from a cast bar, subjecting said cast bar to a homogenizing annealing treatment, for 1 to 200 hours at a temperature which is 10° to 200° C. below the solidus temperature of the alloy cooling machining, coating with a lubricant, and isothermally extruding at a temperature of 700° to 850° C., using a ram speed of at least 0.01 mm/s, a conically shaped extrusion die with rounded-off edges, and a reduction ratio of 4:1 to 20:1.

4,404,026

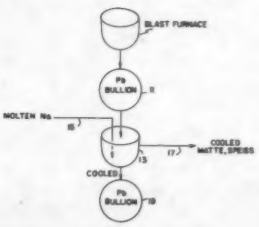
PROCESS FOR SEPARATION OF DROSS ELEMENTS COMBINING SODIUM ADDITION TO MOLTEN BULLION FOLLOWED BY CONTROLLED SOLIDIFICATION OF CASTING

Carl R. Di Martini, Piscataway, and John E. Casteras, Colonia, both of N.J., assignors to ASARCO Incorporated, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,777

Int. Cl.³ C22B 13/06

U.S. Cl. 75—63 10 Claims



1. A process for the separation of elemental lead from blast furnace bullion containing a substantial amount of PbS comprising:

forming a pool of molten lead bullion;

casting the bullion into a heat resistant mold;

cooling the cast bullion to a predetermined temperature to form a partial matte crust covering the surface of the bullion;

adding a sodium-containing reagent selected from the group consisting of metallic sodium, Na_2CO_3 and Na_2CO_3/coke to the lead bullion, the sodium-containing reagent reacting with PbS to form elemental lead and Na_2S;

cooling the lead bullion to a predetermined solidification temperature a Na_2S-Cu_2S matte and a Cu_3As, Cu_3Sb and Fe_2As speiss forming on the surface of the molten lead pool during cooling with a substantial amount of the

mechanically entrained and chemically released elemental lead falling into the molten lead pool; and

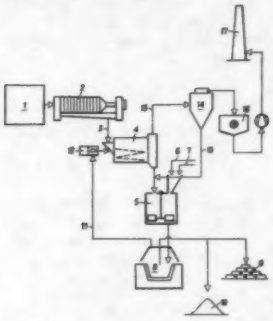
separating the solidified matte and speiss from the lead bullion.

4,404,027

METHOD OF RECOVERING HEAVY METALS

Ernst Eichberger, Wels, and Gerhard Lazar, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Feb. 22, 1982, Ser. No. 350,439
Claims priority, application Austria, Mar. 5, 1981, 1014/81
Int. Cl.³ C22B *15/00*
U.S. Cl. 75—72 7 Claims



1. In a method of recovering heavy metals, including nickel, cobalt, copper, silver, gold, tin, zinc and chromium, form filter residues containing at least one of metal oxides, metal hydroxides and metal carbonates, which comprises the steps of drying said filter residues, adding carbon-containing reducing agents to said dried filter residues to produce a mixture, and reducing said mixture in a furnace, the improvement wherein:

metal-containing filter residues having a water content of 30% to 80% are dried to obtain a product having a grain size of 0.1 mm to 5 mm and a packing density of 0.4 kg/l to 1.2 kg/l, and wherein the mixture of said dried filter residues and carbon-containing reducing agents

(a) is charged into a crucible furnace at a filling height of 0.4 m to 1.5 m;

(b) heated in said crucible furnace to a temperature higher than the melting point of the metal to be recovered; and

(c) maintained at an approximately constant height therein by refilling said furnace with said mixture as volume reductions occur.

4,404,028

NICKEL BASE ALLOYS WHICH CONTAIN BORON AND HAVE BEEN PROCESSED BY RAPID SOLIDIFICATION PROCESS

Viswanathan Panchanathan, Billerica; Ranjan Ray, Waltham, and Bill C. Giessen, Cambridge, all of Mass., assignors to Marko Materials, Inc., Billerica, Mass.

Filed Apr. 27, 1981, Ser. No. 257,778
Int. Cl.³ C22C *19/08*
U.S. Cl. 75—244 3 Claims

1. Fine grained nickel-base alloys containing dispersed borides in bulk form having composition $Ni_aCu_bAl_cM_dSi_eB_f$ wherein M is at least one element selected from the group consisting of Fe, Co, Vn Mn and Cr, and the subscripts represent atom percent having the values a=40–79, b=16–40, c=0–15, d=0–10, e=0–5, and f=5–15, with the provisos that the sum of b+c+d may not exceed 50 atom percent, the sum of e+f may not exceed 15 atom percent and the sum of a+b+c+d+e+f is 100, made by subjecting the powders of the said alloys to application of pressure and heat, said powders being made by the method comprising the following steps:

(a) forming a melt of said alloy

(b) depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range of approximately 10^5 to 10^7 °C./second and form thereby a rapidly solidified brittle strip of said alloys characterized by predominantly a metastable single solid solution structure,

(c) comminuting said strip into powders.

4,404,029

NON-LINEAR POLYCRYSTALLINE BARIUM TITANATE-TYPE DIELECTRIC ELEMENT

Shoichi Iwaya; Hitoshi Masumura, both of Akita; Yoshifumi Midori, Honjo; Yasunobu Oikawa, and Hisao Abe, both of Akita, all of Japan, assignors to TDK Electronics Co., Ltd., Nihonbashi, Japan

Continuation of Ser. No. 210,590, Nov. 26, 1980. This application Feb. 19, 1982, Ser. No. 350,379
Claims priority, application Japan, Nov. 26, 1979, 54-152573
Int. Cl.³ C04B *35/00*
U.S. Cl. 501—139 3 Claims

1. A non-linear dielectric element which utilizes the non-linearity of a dielectric constant that depends on an electric field consisting of a sintered polycrystal mainly composed of $Ba(Ti_{0.90\text{-}9.98}Sn_{0.02\text{-}0.10})O_3$ and having an average grain diameter in the range of from 10 to $\alpha\mu m$.

4,404,030

ANTI-PLATING AGENT FOR ONE-SIDE HOT-DIP PLATING PROCESS

Hideo Komura, Ichihara; Kazuaki Kyohno, Chiba; Takahisa Yoshihara, Chiba; Syoji Shijima, Chiba, and Minari Goto, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Mar. 23, 1982, Ser. No. 361,082
Claims priority, application Japan, Mar. 27, 1981, 56-45295; Oct. 26, 1981, 56-171264
Int. Cl.³ B05D *5/08*
U.S. Cl. 106—2 7 Claims

1. An anti-plating agent for use in one-side hot-dip plating process consisting of an aqueous slurry which is prepared by dissolving or dispersing the following substances in water: an alkali metal silicate; boric acid; a hydroxide of an alkali metal; at least one of magnesia and magnesium hydroxide; at least one of titania and titanium hydroxide; and at least one aluminium compound selected from a group consisting of alumina, aluminium hydroxide and alumina sol.

4,404,031

PROCESS FOR PRODUCING HYDRAULIC CEMENTS

Giichi Sudoh, Chichibu; Keiichi Minegishi, Kumagaya; Kanjiro Ishizaki, and Ikuo Uchida, both of Chichibu, all of Japan, assignors to Chichibu Cement Kabushikikaisha, Tokyo, Japan

Filed Jan. 4, 1982, Ser. No. 336,689
Claims priority, application Japan, Apr. 2, 1981, 56-48378
Int. Cl.³ C04B *7/14*
U.S. Cl. 106—90 2 Claims

1. A process for producing hydraulic cements characterized by mixing a first raw material which is 3 to 20% by weight of a clinker or cement having as a main component a calcium sulfoaluminate compound or calcium aluminate compound having a mol ratio of CaO/Al_2O_3 less than 3 as $3CaO.3Al_2O_3.CaSO_4$, $CaO.Al_2O_3$ or $12CaO.7Al_2O_3$ when expressed as a calcium sulfoaluminate compound or calcium aluminate compound, a second raw material which is 3 to 20% by weight of a clinker or cement having as a main component a tricalcium silicate $3CaO.SiO_2$ or dicalcium silicate $2CaO.SiO_2$ as a Portland cement or mixed cement when expressed as a calcium silicate compound, a third raw material which is 6 to 40% by weight of a gypsum as gypsum anhydride or gypsum dihydrate

when expressed as $CaSO_4$, a fourth raw material which is 20 to 88% by weight of a blast furnace granulated slag and a fifth raw material which is 0.1 to 1.5% by weight of an oxycarboxylic acid or sodium salt thereof which is sodium citrate, malic acid, tartaric acid or sodium tartarate so that a mol ratio of $(3Al_2O_3+1.5SiO_2)/(CaO—SO_3)$ may not be less than 1.

4,404,032

PROCESS FOR PRODUCING CEMENT CLINKER

Boris I. Nudelman; Mikhail G. Chepkalenko; Alevtina A. Gasanova; Guzal A. Galimova; Roza Khaichkis; Ravkhat E. Uraev, all of Tashkent; Turgun K. Tashpulatov, Navoi; Erkin M. Butaev, Tashkent; Fedor Y. Adam, Navoi; Arnold A. Kevvai, Tashkent; Rashida G. Bodyagina, Tashkent; Sunnat I. Ibragimov, Tashkent, and Alexandr P. Fedorov, Akhan-Garan, all of U.S.S.R., assignors to Tashkentsky Nauchnoissledovatelsky I Proektny Institut Stroitelnykh Materialov, U.S.S.R.

Filed Mar. 23, 1982, Ser. No. 360,906
Int. Cl.³ C04B 7/44
U.S. Cl. 106—100 **10 Claims**

1. A process for producing cement clinker comprising:
dry grinding raw cement components to prepare a raw meal;
mixing said raw meal with a solid fuel to prepare a batch mixture;
pelletizing said batch with concurrent addition of calcium chloride thereto;
heat treating the resultant pellets of raw mix while in a drying zone in a dense layer to dry the raw mix;
subsequently roasting the layer of pellets while in a roasting zone by burning a solid fuel over the surface of said layer and maintaining the temperature of resultant gaseous combination products at a temperature between 1150° and 1250° C. for no longer than half of the period in which roasting is effected;
while roasting said layer of pellets of raw mix drawing fuel combustion gaseous products through said dense layer of pellets and removing exhaust gaseous products released therefrom;
lowering said temperature to between 900° in preparation for cooling said dense layer of pellets; and
cooling said dense layer of pellets in a cooling zone to prepare a cement clinker.

4,404,033

METHOD OF MAKING COLLAGEN FIBERS FOR SURGICAL USE

Wolfgang Steffan, Neustadt/Donau, Fed. Rep. of Germany, assignor to CHEMOKOL Gesellschaft zur Entwicklung von Kollagenprodukten, Stolberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 267,776, May 28, 1981, abandoned. This application Mar. 15, 1982, Ser. No. 358,025
Claims priority, application Fed. Rep. of Germany,
Int. Cl.³ A23J 1/10; C08L 89/00; D06M 3/02
U.S. Cl. 106—161 **7 Claims**

1. In a method for the manufacture of collagen fibers for surgical purposes, in which a starting material selected from the group consisting of Achilles tendons and hides from cattle is decomposed in an alkaline medium and are mechanically treated after treatment with an acid, deswelled, cross-linked and dried, the improvement comprising the steps of:
decomposing said starting material in an alkaline medium to an amino-nitrogen content of from 0.15 to 0.30 μmoles/g and after a hydrochloric acid treatment and washing to a pH value of from 2 to 4, the swollen collagen substance is reduced in thickness under pressure forming a two-dimensional network, then the individual longitudinal fibers are exposed by hackling, and then, after deswelling, the fibers are cross-linked with hexamethylene diisocyanate in the presence of a nonionic or cationic emulsifier and are dehydrated and further processed on textile machines.

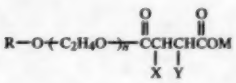
4,404,034

PROCESS FOR PREPARING AQUEOUS DISPERSION OF ROSIN-BASE MATERIALS

Kimio Kawatani, Suita, and Ryoji Kaji, Kawachinagano, both of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1981, Ser. No. 302,395
Int. Cl.³ C08L 93/04; C09F 1/04
U.S. Cl. 106—238 **5 Claims**

1. In a process for preparing an aqueous dispersion of a rosin-base material by mixing a melt of the rosin-base material, a dispersant and water to obtain a dispersion comprising a continuous phase of the rosin-base material and a dispersed phase of the water, and adding water to the dispersion to invert the dispersion to the contemplated aqueous dispersion comprising a dispersed phase of the rosin-base material and a continuous phase of the water; the improvement wherein
said dispersant comprises at least one compound represented by the formula



wherein R is straight-chain or branched-chain alkyl or alkenyl group having 10 to 24 carbon atoms, n is an integer of 7–18, one of X and Y is —SO_3M and the other thereof is a hydrogen atom, and M is a monovalent cation.

4,404,035

COMPOSITIONS COMPRISING A WAX AND AN ORGANOPOLYSILOXANE

Isao Ona, Sodegaura; Masaru Ozaki, and Yoichiro Taki, both of Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 358,161
Claims priority, application Japan, Mar. 19, 1981, 56-39902
Int. Cl.³ C08H 9/06; C08L 91/06
U.S. Cl. 106—271 **5 Claims**

1. A composition comprising a homogeneous mixture of
(A) from 0.5 to 99.5 parts by weight of a wax and
(B) from 0.5 to 99.5 parts by weight of an organopolysiloxane having the formula

$$Z(R_2SiO)_m(RQSiO)_nSiR_2Z$$

wherein R denotes a substituted or unsubstituted monovalent hydrocarbon group, Q denotes a hydrocarbon ester group having the formula $—R^1CO_2R^2$, Z denotes an R group or a Q group, R^1 denotes a divalent hydrocarbon group, R^2 denotes a saturated monovalent hydrocarbon group having at least 3 carbon atoms, m and n each has an average value of zero or more, the sum of m+n has an average value of from 1 to 2000, there being an average of at least one Q group per molecule of organopolysiloxane (B) and the total weight of component (A) plus component (B) being 100 parts by weight.

4,404,036

EASILY DISPERSING PHTHALOCYANINE BLUE

Thomas E. Donegan, Holland, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 15, 1981, Ser. No. 311,335
Int. Cl.³ C04B 31/00; C09C 1/00, 3/00
U.S. Cl. 106—308 M **12 Claims**

1. A process for producing an easily dispersible copper phthalocyanine blue pigment comprising:
(A) grinding
1. copper phthalocyanine blue crystals with
2. an inorganic salt and digesting the ground copper phthalocyanine blue in
water containing

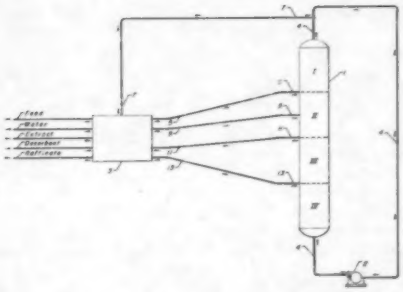
a strong mineral acid,
(B) separately preparing an emulsion by dissolving
1. a resin in
2. an organic solvent,
3. an emulsifying agent and
4. water
(C) mixing
1. said emulsified resin with
2. said digested ground copper phthalocyanine pigment and
(D) separating the pigment from the other materials.

4,404,037

SUCROSE EXTRACTION FROM AQUEOUS SOLUTIONS FEATURING SIMULATED MOVING BED

Donald B. Broughton, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 12, 1982, Ser. No. 407,682
Int. Cl.³ C13D 3/12
U.S. Cl. 127—55 10 Claims



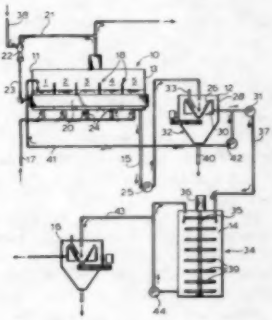
1. A process for separating sucrose from an aqueous solution of sucrose and at least one of the compounds comprising betaine and a mineral salt which process comprises contacting at adsorption conditions said mixture with a solid adsorbent exhibiting selectivity for said sucrose, which process comprises the steps of:
(a) providing net positive fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with the terminal zones of said column connected to provide a continuous connection of said zones;
(b) providing the first of said zones as an adsorption zone in said column, said zone defined by the adsorbent located between a feed inlet stream at an upstream boundary of said zone and a raffinate outlet stream at a downstream boundary of said zone;
(c) providing another of said zones as a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract outlet stream at an upstream boundary of said purification zone and said feed inlet stream at a downstream boundary of said purification zone;
(d) providing another of said zones as a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent inlet stream at an upstream boundary of said zone and said extract outlet stream at a downstream boundary of said zone;
(e) passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of sucrose by said adsorbent in said adsorption zone and withdrawing a raffinate outlet stream from said adsorption zone;
(f) passing a desorbent comprising alcohol into said desorption zone at desorption conditions to effect the displacement of said sucrose from the adsorbent in said desorption zone;
(g) withdrawing an extract stream comprising said sucrose and desorbent material from said desorption zone;
(h) passing a water inlet stream into said purification zone upstream of said feed inlet stream in an amount sufficient to cause the magnitude of said net positive flow in said column at the point of introduction of said water inlet stream to be not greater than zero; and,
(i) periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed inlet stream, raffinate outlet stream, desorbent inlet stream, extract outlet stream and water inlet stream to effect the shifting of zones through said adsorbent and the production of extract outlet and raffinate outlet streams.

4,404,038

PROCESS AND INSTALLATION FOR PRODUCING LACTOSE CRYSTALS

Paul Credoz, Hellemmes Lille, and Pierre Beuneu, Roubaix, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Nov. 10, 1981, Ser. No. 319,909
Claims priority, application France, Nov. 10, 1980, 80 23958
Int. Cl.³ C13F 1/02, 1/06; C13K 5/00
U.S. Cl. 127—60 10 Claims



1. A process of producing crystallized lactose from lactoserum which comprises the steps of:
(a) continuously feeding small-size crystals of lactose to an inlet end of a crystallization apparatus comprising a succession of compartments extending from the inlet end to an outlet end of the crystallization apparatus, said small-size crystals constituting seeds of crystallization,
(b) continuously feeding lactoserum to one of the compartments of the crystallization apparatus while continuously feeding the small-size lactose crystals,
(c) continuously displacing the lactoserum and lactose crystals through the successive compartments to the outlet end of the crystallization apparatus,
(d) heating the lactoserum in the compartments so as to maintain its temperature at a maximum value compatible with the thermal sensibility of the lactoserum and cause a portion of water from the lactoserum to be evaporated,
(e) controlling the flow of lactoserum fed to the compartments so as to maintain the concentration of the lactoserum at a desired value and assure a regular growth of the lactose crystals, whereby a mixture of a mother liquor and lactose crystals is obtained,
(f) continuously removing said mixture from the outlet end of said crystallization apparatus and feeding the removed mixture to a first continuously operating centrifugal drier having a screen,
(g) continuously separating in said first drier the lactose crystals whose dimensions exceed the range of 40 to 90

microns from the mother liquor, the crystals having dimensions below said range being left in the mother liquor,

(h) continuously cooling the mother liquor discharged from said first drier to cause the crystals left in the mother liquor to grow,

(i) continuously feeding the mother liquor with the grown crystals to a second continuously operating centrifugal drier, and continuously separating the grown crystals from the mother liquor.

4,404,039

CLEANSER FOR ANODIZED SURFACES OF ALUMINUM AND ALLOYS THEREOF AND METHOD FOR USING SAME

Rainer Osberghaus, Düsseldorf; Hans Ellwanger, Leichlingen; Horst Marsen, Kerpen, and Harald Bossek, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,295

Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119538

Int. Cl.³ C23G *1/06*; C25D *11/18*

U.S. Cl. 134—3 **15 Claims**

1. In a process for cleaning an anodized surface of aluminum or an alloy thereof where a cleaning agent is applied to the anodized surface and then the cleaning agent is removed after a sufficient period of contact,

the improvement which comprises applying to the anodized surface at ambient temperature a thin film of a cleaning composition comprising an acid solution consisting essentially of:

(a) from about 3 to 30 percent by weight, based upon the total weight of the acid solution, of nitric acid, calculated as a 65% aqueous solution;

(b) from about 0.1 to 20 percent by weight, based upon the total weight of the acid solution, of partial esters of phosphoric acid;

(c) from about 0.3 to 30 percent by weight, based upon the total weight of the acid solution, of a phosphonic acid or phosphonocarboxylic acid with complexing action;

(d) from about 0.5 to 30 percent by weight, based upon the total weight of the acid solution, of nonionic and/or anionic tensides;

(e) from 0 to about 30 percent by weight, based upon the total weight of the acid solution, of solubilizers and/or organic solvents; and

(f) from about 40 to 90 percent by weight, based upon the total weight of the acid solution, of water,

said solution having a pH of less than 2, and then rinsing off the cleaning composition with water.

4,404,040

SHORT CHAIN FATTY ACID SANITIZING COMPOSITION AND METHODS

Yueh Wang, Apple Valley, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jul. 1, 1981, Ser. No. 279,442

Int. Cl.³ B08B *9/00*; C11D *3/48, 7/08*; A61L *2/00*

U.S. Cl. 134—22.14 **26 Claims**

18. A low foaming, aqueous, antimicrobial, sanitizing composition which comprises:

(a) at least about 50 parts per million (ppm) short chain aliphatic fatty acid having about 6 to 14 carbon atoms;

(b) at least about 100 ppm of a hydrotrope-solubilizer for the fatty acid; and

(c) sufficient hydrotrope-solubilizer-compatible acid so that the composition has a pH in the range of 2.0 to 5.0.

22. A method of sanitizing substantially fixed "in-place" process facilitates comprising:

introducing into the process facilitates the composition of claim **18** at a temperature in the range of about 40° F. (4° C.) to 140° F. (60° C.);

circulating the composition through the process facilitates for a time sufficient to sanitize the process facilitates; and

draining the composition .

4,404,041

METHOD OF PRODUCING ELONGATED LARGE-SIZE FORGED ARTICLE

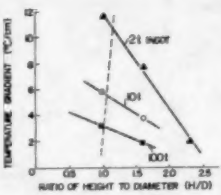
Kimihiko Akahori, Katsuta; Shigeo Maeno, Ibaraki; Hideyo Kodama, and Norio Morisada, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,537

Claims priority, application Japan, Nov. 2, 1981, 56/174635

Int. Cl.³ C21D *8/00*

U.S. Cl. 148—2 **22 Claims**



11. A method of producing a steam turbine rotor shaft comprising: preparing molten metal of an alloy steel containing 0.08 to 0.25 wt% of carbon, 0.02 to 0.15 wt% of niobium, 9 to 12 wt% of chromium and more than 80 wt% of iron, pouring said molten metal and solidifying the same in a metal mold having a ratio H/D of the height H of the body neglecting the hot top portion to the diameter D at the height of $\frac{1}{4}$ H falling within a range of not greater than 1, forging the ingot by applying pressure in the radial direction until the heightwise length of a forged article becomes greater than a diameter of the forged article, subjecting the forged article to an annealing, subjecting the annealed forged article to a machining to form a half-finished rotor shaft, subjecting the machined half-finished rotor shaft to a hardening/tempering treatment and subjecting the treated half-finished rotor shaft to a finish machining.

4,404,042

METHOD FOR COLOR-PAINTING ON CHROMIUM-PLATED SURFACE

Tomoyuki Okada, Tsu; Masuo Fukuda, Toda, and Hideki Sugihara, Tokyo, all of Japan, assignors to Sankei Giken Kogyo Kabushiki Kaisha, Akabaneminami, Japan

Filed Jun. 10, 1981, Ser. No. 272,275

Claims priority, application Japan, Aug. 21, 1980, 55-115170

Int. Cl.³ C23C *1/10*

U.S. Cl. 148—6.2 **5 Claims**

1. A method for color-painting on a chromium-plated surface of an object which comprises:

(a) effecting chromium plating on the surface of the object to be painted;

(b) applying to said chromium-plated surface a mixture of transparent paint and coloring matter, said transparent paint consisting of:

(1) methylphenyl silicon resin varnish containing methyl group and phenyl group at a ratio of 1:0.5 to 1.1: 45–63% by weight

(2) methylphenyl silicon resin varnish containing methyl group and phenyl group at a ratio of 1:0.3 to 0.4: 45 to 28% by weight

(3) silicon resin varnish modified with a resin selected from the group consisting of acryl, polyester, and epoxy resins: 9% by weight or below

(4) additional solvents:

xylol: 5% by weight

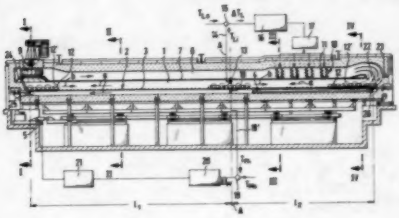
butyl "Cellosolve": 2% by weight
butanol: 2% by weight
(5) various adjuvants selected from the group consisting of adhesion promoter of silicon resin varnish, wetting agent, dispersing agent, and color-separation preventative agent: 1% by weight.

4,404,043

METHOD OF AND AN APPARATUS FOR CONTINUOUS HEAT TREATMENT OF SEPARATED ELONGATED METALLIC MATERIAL

Friedrich W. Elhaus, Jägerhofstr. 117 a, D-5600 Wuppertal 1, and Manfred Wüschle, Singen, both of Fed. Rep. of Germany, assignors to Friedrich W. Elhaus, Wuppertal, Fed. Rep. of Germany

Continuation of Ser. No. 34,356, Apr. 30, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,612
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907960
Int. Cl.³ C22F *1/04*
U.S. Cl. 148—13 **21 Claims**



1. In a method of heat treatment of elongated metallic material, such as round bars or billets, in which the material is moved through a preheating section and a holding section, such that the material is preheated to a desired temperature in the preheating section and is subsequently maintained at the desired temperature in the holding section, the improvement comprising:

circulating a volume of gas through a gas heating area adjacent the holding section and through a gas chamber common to both the preheating section and the holding section for circulating the volume of gas, thereby both preheating the material and maintaining the material at the desired temperature with a single flow of circulating heated gas.

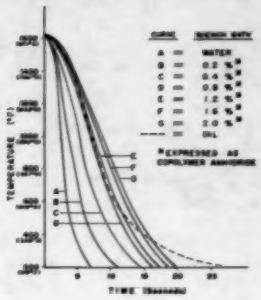
4,404,044

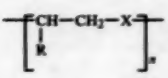
METHOD OF QUENCHING

Joseph F. Warchol, West Norriton, Pa., assignor to E. F. Houghton & Co., Valley Forge, Pa.

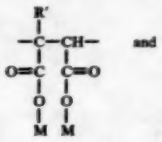
Filed Sep. 8, 1981, Ser. No. 299,961
Int. Cl.³ B23K *35/24*
U.S. Cl. 148—18 **6 Claims**

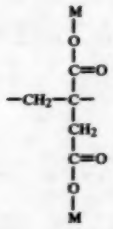
1. In a process of quenching which is useful in the heat treatment of metals wherein a metal is heated to an elevated temperature and then quenched in a bath comprising a liquid quenching medium to effect desirable metallurgical changes in the metal, the improvement which comprises using as said quenching medium an aqueous solution consisting essentially of from about 0.2% to about 10%, by weight, expressed as the anhydride, of a water-soluble salt of a copolymer containing recurring units of the general formula:





in which X is selected from the group consisting of:





in which R is a straight or branched chain alkyl group in which the backbone of the chain contains from about 8 to about 28 carbon atoms, R′ is hydrogen or methyl, M is a cation selected from the group consisting of an alkali metal cation, an ammonium ion, a lower alkyl amine ion, and a water-soluble alkanolamine ion, and n is an integer which provides said copolymer with a molecular weight of from about 25,000 to about 250,000.

4,404,045

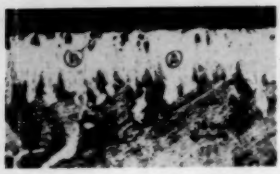
SURFACE-BORONIZED PIECES

Francois H. J. Thevenot, Saint-Etienne; Patrice M. V. Goeuriot, Firminy; Julian H. Driver, Saint-Etienne, and Jean-Paul R. Lebrun, Bougival, all of France, assignors to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines), Paris, France

Division of Ser. No. 123,425, Feb. 21, 1980, Pat. No. 4,289,545. This application May 8, 1981, Ser. No. 261,940
Claims priority, application France, Feb. 27, 1979, 79 04991
Int. Cl.³ C23C *9/00*
U.S. Cl. 148—31.5 **3 Claims**

1. A carbon steel piece which has been subjected to a boronising treatment that effects a first very thin layer about 10

microns in thickness of non-oriented FeB and Fe_2B crystals covering a second, thick layer of Fe_2B crystals about 170



microns in thickness and having an acicular formation at the interface between said second layer and said carbon steel.

4,404,046

METHOD OF MAKING PERMANENT MAGNET OF MN-AL-C ALLOY

Yoichi Sakamoto, Hirakata; Akihiko Ibata, Izumisano; Shigeru Kojima, Yawata, and Tadao Ohtani, Ise, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 5, 1981, Ser. No. 231,625

Claims priority, application Japan, Feb. 7, 1980, 55-14542; Feb. 27, 1980, 55-23905; Apr. 14, 1980, 55-49367

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—101 **5 Claims**

1. A method of producing a polycrystalline permanent magnet, comprising the steps of

preparing a polycrystalline Mn-Al-C alloy magnet having a specified direction of easy magnetization; and

subjecting said magnet to compressive working in said direction at a temperature of 550° to 780° C., the degree of said compressive working being equivalent to a logarithmic strain of $\leqq -0.1$ and the working in said step, at least up to a logarithmic strain of -0.1, being free compression.

5. A permanent magnet of Mn-Al-C alloy having a specified plane of easy magnetization, the alloy being magnetically isotropic in said specified plane and anisotropic in planes perpendicular to said specified plane, which is produced by a method comprising the steps of

preparing a polycrystalline Mn-Al-C alloy magnet having a specified direction of easy magnetization; and

subjecting said magnet to compressive working in said direction at a temperature of 550° C. to 780° C., the degree of said compressive working being equivalent to a logarithmic strain of $\leqq -0.1$ and the working in said step, at least up to a logarithmic strain of -0.1, being free compression.

4,404,047

PROCESS FOR THE IMPROVED HEAT TREATMENT OF STEELS USING DIRECT ELECTRICAL RESISTANCE HEATING

Gerald W. Wilks, Calumet City, Ill., assignor to LaSalle Steel Company, Chicago, Ill.

Filed Dec. 10, 1980, Ser. No. 214,878

Int. Cl.³ C21D *1/40*

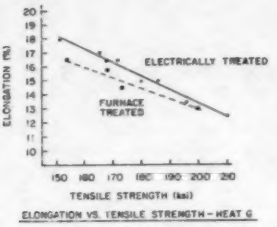
U.S. Cl. 148—131 **7 Claims**

1. A method for heat-treating a steel workpiece which substantially eliminates quench cracking and quench distortion, which method comprises

(a) affixing suitable electrical contacts to opposite ends of a single steel workpiece of finite length and uniform cross section that is susceptible to quench cracking and quench distortion when austenitized in a conventional furnace and severely quenched,

(b) rapidly electrically heating the entire workpiece to an austenitizing temperature above the A_3 temperature for said steel such that the heating time required between the A_1 and the austenitizing temperature is less than 100 seconds,

(c) immediately quenching the entire austenitized workpiece in a liquid quenching medium having a severity of quench factor equal to or greater than that of unagitated water to form a predominantly martensitic microstructure, and



ELONGATION VS. TENSILE STRENGTH – HEAT G

(d) tempering said hardened workpiece by rapidly electrically heating the entire workpiece to a temperature below the A_1 temperature for said steel while maintaining said workpiece in tension at a load level below the yield strength of the steel.

4,404,048

SEMICONDUCTOR DEVICE MANUFACTURE

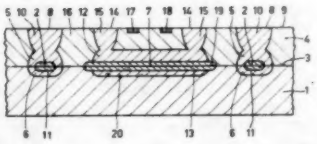
Dirk A. Vogelzang, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,500

Claims priority, application Netherlands, Dec. 17, 1980, 8006827

Int. Cl.³ H01L *21/20, 21/223*

U.S. Cl. 148—175 **4 Claims**



1. A method of manufacturing a semiconductor device, which comprises:

providing a p-type monocrystalline silicon substrate having a major surface;

providing a p-type dopant at a part of said major substrate surface and diffusing said dopant into the substrate;

providing an n-type dopant having a smaller diffusion coefficient than that of said p-type dopant at said part of the major substrate surface where the p-type dopant is provided in order to inhibit diffusion of said p-type dopant;

diffusing said n-type dopant into the substrate;

then forming an n-type epitaxial silicon layer having an upper surface on said major surface of the substrate;

providing a further p-type dopant at a part of said upper surface of the epitaxial layer opposite said part of the major surface of the substrate; and

then diffusing said p-type dopants into the epitaxial layer from both sides by a thermal treatment to form diffused p-type regions which meet in said epitaxial layer.

4,404,049

HARD FACING NICKEL-BASE ALLOY

Kanichi Tanaka, Yawata, and Kensuke Hidaka, Kyoto, both of Japan, assignors to Fukuda Metal Foil & Powder Co., Ltd., Kyoto, Japan

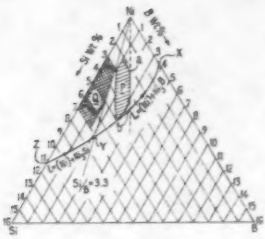
PCT No. PCT/JP79/00026, § 371 Date Oct. 24, 1979, § 102(e) Date Oct. 24, 1979, PCT Pub. No. WO79/00772, PCT Pub. Date Oct. 4, 1979

PCT Filed Feb. 5, 1979, Ser. No. 189,843

Claims priority, application Japan, Mar. 16, 1978, 53-30709; Aug. 24, 1978, 53-103402

Int. Cl.³ C22C *19/05*

U.S. Cl. 148—427 7 Claims



1. A hard-facing nickel-base alloy having an impact value of more than 0.9 kgm/cm^2 and a hardness times impact value of greater than 45, said alloy consisting essentially of 0.05 to 1.5% by weight boron, 3 to 7% by weight silicon, 7.5 to 35% by weight chromium, 0.05 to 1.5% by weight carbon, the balance being substantially nickel and the weight ratio of silicon to boron (Si/B) being more than 3.3 to avoid the formation of the binary eutectic $Ni + Ni_3B$.

4,404,050

WATER-IN-OIL EMULSION BLASTING AGENTS CONTAINING UNREFINED OR PARTLY REFINED PETROLEUM PRODUCT AS FUEL COMPONENT

William J. Yorke, St. Bruno de Montarville; Rejean Binet, St. Bruno; Ming C. Lee, Longueuil, and Howard A. Bampfield, Otterburn Park, all of Canada, assignors to C-I-L Inc., North York, Canada

Filed Sep. 29, 1982, Ser. No. 427,495

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 8 Claims

1. A water-in-oil emulsion explosive composition comprising a continuous carbonaceous fuel phase and a discontinuous aqueous oxidizer salt solution phase wherein the said continuous carbonaceous fuel phase comprises an unrefined or partly refined petroleum product, the said petroleum product being characterised in that,

(a) the component molecules have between 20 and 80 carbon atoms and less than 50% of the said molecules having a number of carbon atoms within the same five carbon atom range, and,

(b) wherein the said unrefined or partly refiaed petroleum product comprises at least 10% by weight of flowable oil if the said petroleum product is in the form of a petroleum wax or comprises at least 10% by weight of a distillation residue if the said petroleum product is in the form of a petroleum oil or tar.

4,404,051

PRODUCTS AND PROCESSES

Georgina Kais, Victoria, and Michael Markus, East Melbourne, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 40,451, May 18, 1979, abandoned. This application Sep. 2, 1981, Ser. No. 298,892

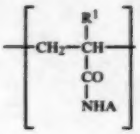
Claims priority, application Australia, May 25, 1978, PD4511

Int. Cl.³ C06B *33/00*

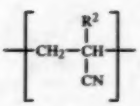
U.S. Cl. 149—37 5 Claims

1. A gelled water bearing explosive composition comprising at least one water soluble inorganic oxygen releasing salt; water; at least one fuel, and characterised in that said explosive composition contains from 0.1 to 3.0%, on a weight basis of the composition, of a copolymeric material comprising four different types of mer units and wherein the mer units are selected one from each of the types of mer units identified by the following formula:

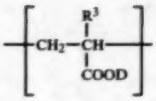
Formula I



Formula II



Formula III



Formula IV

wherein R^1, R^2, R^3, R^4, A and D are independently chosen from the group of radicals consisting of hydrogen, C_1 to C_6 alkyl and C_1 to C_6 hydroxyalkyl radicals; and E is chosen from the group of radicals consisting of C_1 to C_6 hydroxyalkyl, sulphonyl and phosphonyl radicals.

4,404,052

DYNAMIC LAMINATING METHOD AND APPARATUS FOR ULTRASONICALLY BONDING JUXTAPOSED WEBS

Louis T. Persson, and Coenraad E. Riemersma, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

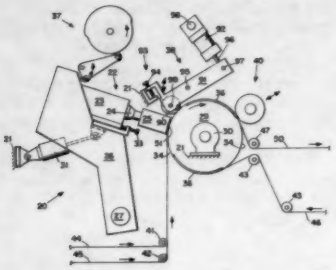
Filed Jan. 26, 1982, Ser. No. 342,700

Int. Cl.³ B29C *27/08*; B32B *31/20*

U.S. Cl. 156—73.1 6 Claims

2. A method of dynamically ultrasonically bonding together a plurality of webs while they are being forwarded in juxtaposed relation along a predetermined path at a predetermined velocity, and which webs are subject to being ultrasonically bonded into a laminate having bonded regions, said web comprising one web and a second web, said second web comprising an elastomeric film, said method comprising the steps of: subjecting the portions of said webs to be bonded to progressively

increasing compressive forces along an elongate portion of said predetermined path, said compressive forces being derived from biasing an ultrasonically powered ultrasonic horn towards a driven anvil; applying sufficient ultrasonic power



and biasing to said ultrasonic horn to effect said bonding; and elongating said second web in the machine direction up to about one-hundred-fifty percent prior to said bonding and constraining said second web to remain so elongated during said bonding.

4,404,053

METHOD OF MAKING A JAVELIN

Victor Saffire, 450 Regimental Rd., King of Prussia, Pa. 19406

Division of Ser. No. 122,126, Feb. 19, 1980, Pat. No. 4,333,643. This application Dec. 15, 1980, Ser. No. 217,202

Int. Cl.³ B32B *31/08;* A63B *65/02*

U.S. Cl. 156—86 **14 Claims**

1. A method of forming a javelin having a hollow body of generally circular cross-section which tapers from a small diameter rear end through a larger diameter middle section to a reduced diameter at its front end, the interior of said body tapering more or less in the same manner as the exterior of the javelin so as to keep the wall thickness of said body more or less constant, said javelin body comprising a plurality of cross-plied bias wound fiber plies, said method comprising:

(a) providing a removable mandrel for receiving said fiber plies;

(b) applying a first ply formed of a resin bonded tape onto said mandrel;

(c) reversing said mandrel and applying a second ply formed of a resin bonded tape over said first ply of resin bonded tape;

(d) alternately reversing said mandrel and applying additional plies of resin bonded tape thereto until a finished underlayer is produced;

(e) applying a first ply formed of a resin bonded graphite tape over said underlayer;

(f) reversing said mandrel and applying a second ply formed of a resin bonded graphite tape over said first ply of resin bonded graphite tape;

(g) alternately reversing said mandrel and applying additional plies of resin bonded graphite tape thereto until a finished javelin body is formed;

(h) applying a heat shrinkable tape over said body;

(i) removing said body from said mandrel;

(j) curing said body;

(k) affixing a metal tip to the front end of said body; and

(l) wrapping a cord grip around mid-portions of said body.

4,404,054

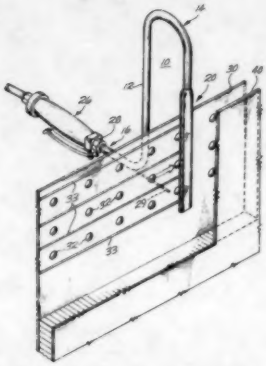
METHOD FOR APPLYING SEALANT BETWEEN FAYING SURFACES OF AIRCRAFT WING STRUCTURES

Jerald L. Dickson, Kirkland, and Harvey E. Green, Jr., Pacific, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 189,281, Sep. 22, 1980. This application Jul. 10, 1981, Ser. No. 282,117

Int. Cl.³ B32B *7/08*

U.S. Cl. 156—92 **2 Claims**



1. In the method of fastening together a wing skin and a spar chord of an aircraft wing structure, the improvement comprising:

opening the joint formed by said wing skin and spar chord a predetermined distance prior to installation of a plurality of fasteners therebetween;

inserting in the opening a thin profiled flattened end portion of a sealing tool, said tool comprising a u-shaped portion intermediate said end portion and a first end portion having means for receiving sealant from a sealant source with said flattened portion having a plurality of apertures distributed therealong in predetermined spaced apart relationship;

simultaneously depositing a plurality of beads of sealant through said apertures and between corresponding rows of fastener holes; and

withdrawing said end portion and closing said joint by installation of said plurality of fasteners between said wing skin and spar chord thereby spreading out said plurality of beads of sealant.

4,404,055

ELASTOMERIC SEAL

Fred B. McCarty, San Pedro, and Christopher M. Gibson, Fountain Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 30, 1981, Ser. No. 259,761

Int. Cl.³ B65C *3/26;* B29C *17/04;* H02K *1/12;* B05D *1/18*

U.S. Cl. 156—156 **1 Claim**

1. The method of making and installing an elastomeric stator bore seal for electrical machines having a rotor, a rotor cavity, and a stator assembly which includes a stator and a stator bore, said method comprising the steps of:

a. obtaining a rigid mold tool similar to said rotor in dimensions and longer in length than said rotor, wherein said rigid mold tool has an opening therin for use in permitting entry of a pressurized gas;

b. coating said rigid mold tool with a release agent;

c. dipping, withdrawing and inverting, and dipping, withdrawing and inverting said rigid mold tool, in repeated

cycles, into and out of a solution of an elastomer dissolved in a solvent, until a thickness of approximately 0.025 of an inch of an elastomeric coating is obtained on said rigid mold tool and the solvent remaining in said coating has evaporated, wherein said elastomer used, and said elastomeric coating obtained, are capable of withstanding exposure to temperatures in the range of from approximately −65 degrees Fahrenheit to approximately +400 degrees Fahrenheit;

d. curing said elastomeric coating on said rigid mold tool, thereby attaining a final outer surface on said elastomeric coating;

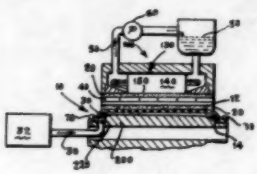
e. applying an adhesive to said stator bore;

f. applying glass cloth to said adhesive stator bore, thereby adhering said glass cloth to said adhesive and to said stator bore;

g. applying an adhesive to said final outer surface of said cured elastomeric coating;

h. placing the adhesive-covered elastomeric coating, with said rigid mold tool therein, into said stator bore;

i. inflating with a pressurized gas introduced through said



opening in said rigid mold tool, and thereby expanding, said adhesive-coated elastomeric coating until said coating is lifted from said mold rigid tool and said coating is in uniform pressure contact with said glass cloth covering said stator bore, with said coating thereby covering said glass cloth and said stator bore;

j. heating in a heating oven, and thereby curing, said adhesive on said stator bore and said adhesive on said outer surface of said elastomeric seal, thereby bonding said glass cloth to said stator bore and bonding said elastomeric seal to said glass cloth;

k. removing said pressurized gas and saaid rigid mold tool from within said elastomeric seal;

l. inserting said rotor into said elastomeric seal-covered stator bore;

m. assemblying said rotor and said elastomeric seal-covered stator bore, such that an electrical machine is formed; and

n. cooling said stator by circulating, with a sucking action, a dielectric fluid through said stator assembly, thereby said elastomeric seal excludes said dielectric fluid from said rotor cavity, and said cooling effected by said circulating dielectric fluid reduces loads on said adhesive bonds.

4,404,056

METHOD OF JOINING WATERPROOF VULCANIZED SYNTHETIC RUBBER SHEETS

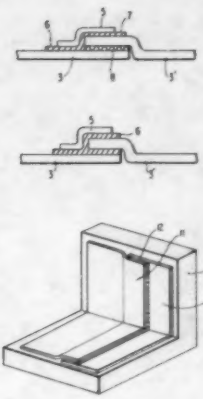
Masanori Kakehi, Kobe; Yoshitaka Higashida, Miki; Kenzo Iwamoto, and Hikaru Kano, both of Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Feb. 25, 1981, Ser. No. 238,282

Int. Cl.³ B29C *19/00*; C09J *7/00*

U.S. Cl. 156—244.11 **6 Claims**

1. A method for joining waterproof vulcanized synthetic rubber sheets wherein a cold-vulcanizable adhesive tape having a Mooney viscosity (ML_{1+5} (100° C.)) of from 5 to 25 and an autoadhesion property, and which is prepared from a blend of (1) 100 parts by weight of a rubbery polymer, (2) from 1 to 2 parts by weight of an oxime vulcanizing agent or from 1 to 3 parts by weight of sulfur or a sulfur-containing vulcanizing agent, (3) from 3 to 4 parts by weight of a PbO_2 vulcanization accelerator in the case of using an oxime vulcanizing agent or from 2 to 6 parts by weight of a thiazole, thiuram, or dithiocarbamate vulcanization accelerator in the case of using a sulfur or sulfur-containing vulcanizing agent, (4) from 30 to 100 parts by weight of an adhesive agent, and (5) from 30 to 150 parts by



weight of a softening agent, is placed between overlapped areas of waterproof vulcanized synthetic rubber sheets and pressed to provide an initial adhesive strength of from 0.5 to 3 kg/25 mm, and the adhesive tape is cold-vulcanized to join the sheets.

4,404,057

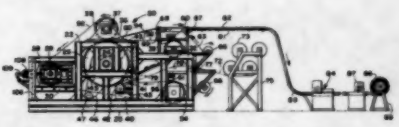
REINFORCED PLASTIC SHEET MACHINE AND METHOD

Robert S. Morrison; Thomas A. DeLuca, both of Ashtabula, and Ernest Pasqualone, Geneva, all of Ohio, assignors to Molded Fiber Glass Companies, Ashtabula, Ohio

Filed Sep. 8, 1981, Ser. No. 300,197

Int. Cl.³ B31F *7/00*

U.S. Cl. 156—324 **27 Claims**



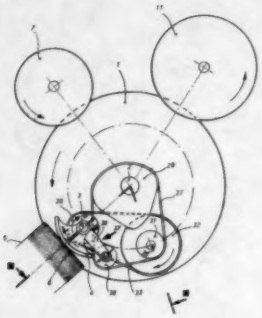
1. A process of continuously forming FRP sheet comprising the steps of depositing a liquid thermosetting resin on a film which is supported on a belt, thereafter depositing glass fiber components on the liquid thermosetting resin, impregnating the glass fiber components with the resin by drawing the glass fiber components and liquid thermosetting resin through a nip defined by a nip roll over which the belt is trained and a heating-curing drum against the periphery of which the belt presses the glass fiber components and resin, and establishing and maintaining a substantially uniform sheet thickness during impregnation of the glass fiber components with the resin and curing of the latter by adjusting the position of the nip roll relative to the drum and by adjusting the tension in the belt.

4,404,058

ROTARY SECTOR DEVICE TURNING AT A VARIABLE ANGULAR SPEED SUITABLE FOR THE WITHDRAWAL AND TRANSFERRING OF LABELS IN AUTOMATIC LABELLING MACHINES

Roberto Marchini, Marmirolo, Italy, assignor to O.C.E.A. S.r.l., Goito, Italy

Filed Apr. 9, 1982, Ser. No. 366,974
Claims priority, application Italy, Apr. 17, 1981, 18107 A/81
Int. Cl.³ B65H 3/20
U.S. Cl. 156—571 5 Claims



1. A rotary sector device turning at a variable angular speed suitable for the withdrawal and transferring of labels in automatic labelling machines, of the kind including a bearing plate (1), fitted on a vertical shaft (2), rotating at a constant angular speed, to which is integral a plurality of rotary sectors (4), turning, each about a corresponding vertical axis (A), at a variable angular speed according to a predetermined law of motion, said rotary sectors (4) coming sequentially into contact, by means of their curved side surface, with a first roller (7) provided with glue turning at a constant angular speed, with a label (6) disposed in a stationary container (5) acting as a magazine and with a second roller (11), provided with pliers suitable for catching said label (6) turning at a constant angular speed, characterized in that said predetermined law of motion is produced by means of a toothed belt (27) kinematically connected to a circular toothed pulley (36) coaxial to a corresponding rotary sector (4) and integral thereto, and to an asymmetric toothed pulley (26) fitted on said vertical shaft (2) and fixed in place, the generating straight lines of the side surface of said asymmetric pulley (26) being parallel to the longitudinal axis of said vertical shaft (2) and spaced therefrom of a variable distance based on the angular speed changes provided for each of said rotary sectors (4) according to the relative position of each of them with respect to said asymmetric pulley (26).

4,404,059

PROCESS FOR MANUFACTURING PANELS TO BE USED IN MICROELECTRONIC SYSTEMS

Vladimir I. Livshits, Izmailovsky bulvar, 55/16, kv. 3; Vladimir I. Golovin, Uralskaya ulitsa, 6, korpus 3, kv. 47, and Vladimir I. Meshkov, ulitsa Martenovskaya, 19/38, kv. 3, all of Moscow, U.S.S.R.

Filed May 26, 1982, Ser. No. 382,407
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—629 5 Claims

1. A process for manufacturing a printed circuit board having at least two conductor layers, comprising the steps of:

disposing first and second masks on first and second opposed major surfaces of a substantially planar substrate comprising a metal etchable in a given etchant;

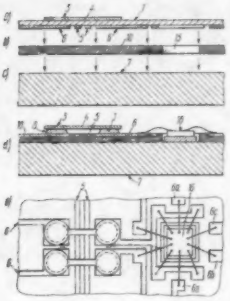
a first electrodeposition step of selectively electrodepositing a first layer comprising a first conductor pattern including bridging elements on said first major surface of said substrate through said first mask, said first layer comprising a metal substantially impervious to said etchant;

a second electrodeposition step, carried out simultaneously with said first electrodeposition step, of selectively electrodepositing a second layer comprising a second conductor pattern, including conductor elements below and oriented transverse to said bridging elements, on said second major surface of said substrate through said second mask, said second layer comprising a metal substantially impervious to said etchant;

said bridging elements having enlarged ends and a constricted portion between said enlarged ends;

removing said first and second masks from said substrate;

pre-etching said second major surface of said substrate by



immersing the same in said etchant, to etch said second major surface to a depth in the range of 0.01 to 0.5 times the width of said conductor elements comprising said second layer;

thereafter immersing said substrate and the first and second layers thereon in said etchant for a sufficient time so that said etchant removes the exposed portions of said substrate below said constricted portions of said bridging elements throughout the entire thickness of the substrate thereat; and

securing an adhesive layer comprising an insulating material to said second layer so that said second layer becomes imbedded in one major surface of said adhesive layer, and securing the other major surface of said adhesive layer to one major surface of a base having two major surfaces.

4,404,060

METHOD FOR PRODUCING INSULATING RING ZONES BY GALVANIC AND ETCH TECHNOLOGIES AT ORIFICE AREAS OF THROUGH-HOLES IN A PLATE

Güenter Trausch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 21, 1982, Ser. No. 370,352
Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118335; Jan. 26, 1982, 3202447
Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—632 9 Claims

1. A method for structuring insulating ring zones by galvanic and etch techniques at respective orifice areas of through-holes in plates, comprising:

(a) applying a relatively thin metal layer onto all surfaces of a plate having a select pattern of through-holes therein, including on side walls of said through-holes;

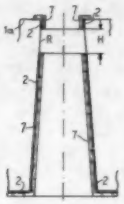
(b) laminating a negative dry resist layer onto a first surface of said plate, under which insulating ring zones are to be generated, in such a manner that a portion of the resist layer penetrates into the respective through-hole orifices;

(c) irradiating the resist layer portions within the through-hole orifices with ultraviolet light directed through said

holes from a second surface of said plate located opposite said first surface thereof;

(d) applying a dry resist layer to said second surface of said plate;

(e) irradiating said resist layers on the first and second surfaces of said plate through masks aligned relative to said through-holes so as to define areas for electrodes on both



of said plate surfaces and stripping-off non-irradiated resist areas in a developer solution; and

(f) galvanically precipitating a metal layer onto all uncovered thin metal layer areas, removing remaining resist layers and selectively etching-off uncovered thin metal layer areas positioned below the just removed resist area so as to define electrodes.

4,404,061

BLEACHING OF LIGNOCELLULOSIC MATERIALS WITH MONOPERSULFURIC ACID OR ITS SALTS

John J. Cael, Washingtonville, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,752
Int. Cl.³ D21C *9/10, 9/16*
U.S. Cl. 162—76 **2 Claims**

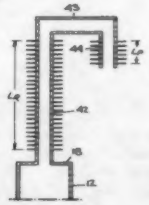
1. A process wherein wood pulp produced from wood chips in a standard alkaline pulping process is bleached with a bleaching agent containing a persulfate ion selected from the group consisting of monopersulfuric acid and its salts with cations in a pH range of from about 2.0 to about 12.0, said bleaching comprising treating said wood pulp with an equivalent of about 0.5 to 5% $KHSO_5$ based on oven dry pulp for 0.5 to 3.0 hours at a temperature between about 40° C. to 80° C.

4,404,062

CONDENSER

Brooks M. Whitehurst, 1983 Hoods Creek Dr., New Bern, N.C. 28560

Continuation of Ser. No. 225,400, Jan. 15, 1981, abandoned. This application Mar. 22, 1982, Ser. No. 360,646
Int. Cl.³ B01D *3/02*
U.S. Cl. 202—185 B **13 Claims**



1. A distillation apparatus comprising elements arranged, sized and dimensioned to provide a product condensate with a purity of at least 95% from a feed of ethanol and water, said elements including:

a still;

a rectifying column mounted over said still;

a reflux condenser mounted over said column to receive a flow of vapor therefrom, said condenser having a first product channel with a surface area for condensing at least some of the vapor thereon to form reflux, said product channel opening directly into said column at a lower end to deliver the reflux directly to said column; and

a product condenser in communication with said reflux condenser to receive the remainder of the vapor therefrom, said product condenser having a second product channel with a surface area for condensing the received vapor thereon to form a product, said surface area of said second product channel being smaller than said surface area of said first product channel.

4,404,063

METHOD FOR THE SEPARATION OF INDOLE

Tadatoshi Honda, Hiratsuka, Japan, assignor to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,094
Claims priority, application Japan, Oct. 8, 1981, 56-159441
Int. Cl.³ B01D *3/34;* **C07D** *209/04*
U.S. Cl. 203—6 **10 Claims**

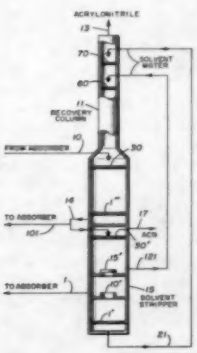
1. In a method for the separation of indole by distilling an indole-containing reaction fluid obtained by the reaction of aniline with ethylene glycol or by the reaction of N-(β-hydroxyethyl)aniline, the improvement which comprises bringing the reaction fluid into contact with a basic substance prior to and/or during the distillation, whereby the deterioration of indole during the distillation procedure is substantially prevented.

4,404,064

WATER EXTRACTIVE DISTILLATION OF OLEFINICALLY UNSATURATED NITRILES

Gordon H. Lovett, Kerrville, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1982, Ser. No. 454,752
Int. Cl.³ B01D *3/40;* **C07C** *120/32*
U.S. Cl. 203—84 **6 Claims**



1. A process for the recovery and purification of acrylonitrile from a feed stream comprising acrylonitrile, acetonitrile, and relatively heavy impurities consisting of

(a) adding said feed stream to a feed point of a recovery column having a top and a bottom operated at water extractive distillation conditions, the feed point being approximately in the middle of said recovery column;

(b) adding to the top of said recovery column a primary solvent water stream, from a source hereafter specified, and adding a secondary solvent water stream, from a

source hereafter specified, to a point intermediate said feed point and top of said recovery column;

(c) removing from the bottom of said recovery column a recovery column bottoms stream comprising water, acetonitrile and heavy impurities;

(d) adding said recovery column bottoms stream to a stripper column having a top and a bottom operated at solvent stripping conditions to remove acetonitrile from an upper portion of said stripper column;

(e) removing said primary solvent water stream from the bottom of said stripper column, and sending same to said recovery column, said primary solvent water being reduced in acetonitrile content, but containing at least a portion of said heavy impurities;

(f) removing, from a point intermediate the top and the bottom of said stripper column said secondary solvent water stream and sending same to said recovery column, said secondary solvent water stream containing relatively less heavy impurities than said primary water stream; and

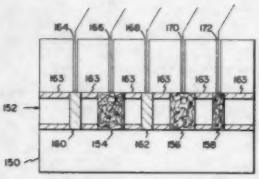
(g) recovering a purified acrylonitrile stream from the top of said recovery column.

4,404,065

ELECTROCHEMICAL DETECTION SYSTEM AND METHOD OF ANALYSIS

Wayne R. Matson, Ayer, Mass., assignor to Enviromental Sciences Associates, Inc., Bedford, Mass.

Filed Jan. 14, 1980, Ser. No. 111,917
Int. Cl.³ G01N *27/30*
U.S. Cl. 204—1 T **68 Claims**



1. A flow cell for electrochemical testing a sample in solution, said cell comprising:

a holder assembly having an inlet for directing a stream of said sample to be tested into said cell, and an outlet for directing tested sample from said cell;

a plurality of electrode elements arranged in a stack in said holder assembly and including at least one active testing electrode, at least one reference electrode, and at least one counter electrode, at least one of said active testing electrodes comprising a solid phase electrode in the form of a solid disk of electrically conductive material having at least one bore extending therethrough and having an active electrode surface located in said at least one bore, said plurality of electrodes being arranged in said stack so that said electrodes are electrically insulated from one another with their respective bores aligned so as to define at least one flow channel connecting said inlet and said outlet; and,

a flow restrictor formed of electrically conductive material located in the bore of at least one of said disks and electrically connected to said disk.

23. In a chromatography apparatus having a chromatographic column through which a sample can be passed whereby species in said sample are separated to produce an eluant fluid stream, an electrochemical detector for analyzing said eluant stream, the improvement wherein said detector comprises a flow cell as defined by claim **1**.

34. In a method of electrochemically analyzing a sample material to identify selected substances therein, the steps of: dissolving said sample material in a carrier therefor to form a test fluid, and passing a stream of said test fluid through an electrolytic flow cell in contact with a detection electrode,

the improvement wherein said flow cell comprises a plurality of electrode elements including at least one solid phase testing electrode arranged in a stack in a holder, each of said electrode elements in said stack comprising a solid body having at least one bore extending therethrough and an active electrode surface located in said at least one bore, said plurality of electrodes being arranged in said stack so that said electrodes are electrically insulated from one another with their respective bores aligned so as to define at least one flow channel for said stream, said flow cell having a plug of electrically conductive material located in the bore of at least one of said solid phase testing electrodes and electrically connected to said electrode, passing said stream through said at least one flow channel in contact with said active electrode surfaces, applying electrical potentials across said stream between selected of said electrodes in said stack, deriving electrical signals resulting on selected of said electrodes in said stack, and sorting said signals to obtain signals which identify said selected substances.

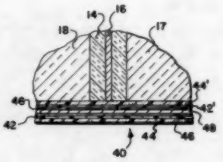
41. In a method according to claim **34**, including the step of passing said test fluid through a chromatography column whereby to separate species of said sample material to produce, an eluant fluid stream, and passing said eluant fluid stream through said flow cell.

4,404,066

METHOD FOR QUANTITATIVELY DETERMINING A PARTICULAR SUBSTRATE CATALYZED BY A MULTISUBSTRATE ENZYME

Jay M. Johnson, Dayton, Ohio, assignor to The Yellow Springs Instrument Company, Yellow Springs, Ohio

Continuation-in-part of Ser. No. 181,459, Aug. 25, 1980, Pat. No. 4,356,074. This application May 13, 1982, Ser. No. 377,765
The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.
Int. Cl.³ G01N *27/54*; C12N *9/04*
U.S. Cl. 204—1 T **9 Claims**



1. In a method for quantitatively determining the amount of a particular substrate, catalyzed by a multisubstrate enzyme (having a direct redox dependent activity) to react with oxygen and form hydrogen peroxide as a reaction product, wherein the improvement comprises the steps of: applying an electrical potential to said enzyme, said electrical potential being sufficient to control the activity of said multisubstrate enzyme, contacting said enzyme with a solution containing at least said particular substrate, and measuring for an electroactive reactant or product of the reaction mechanism whereby a rapid, direct quantitative analysis is obtained.

4,404,067

METHOD OF MANUFACTURING A TIMEPIECE COMPONENT

Tadao Enomoto, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,750
Claims priority, application Japan, Mar. 24, 1981, 56-42645; Apr. 14, 1981, 56-55119
Int. Cl.³ C25D 1/00, 1/20
U.S. Cl. 204—4 13 Claims

1. A method of manufacturing a timepiece dial component comprising the steps of:

preparing an electroforming matrix having a recessed portion formed into a predetermined shape formed therein;

forming a thin layer of an electrically conducting material upon the surface of said recessed portion;

forming a plurality of electroformed metal layers on said electrically conducting layer by performing at least a first electroforming processing step in a first electrolyte to deposit a first elelctroformed metal layer upon said electrically conducting layer and a second electroforming processing step in a second electrolyte to deposit a second electroformed metal layer upon said first electroformed metal layer, with said first electroforming step resulting in internal compressive stress being developed within said first electroformed metal layer and said second electroforming step resulting in internal tensile stress being developed within said second electroformed metal layer;

performing machining of said second electroformed metal layer by mechanical means to provide a desired surface finish thereon; and

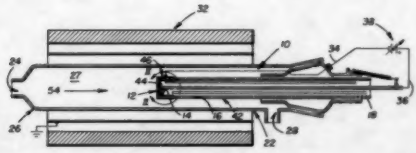
removing said first and second electroformed metal layers from said electroforming matrix as a single unit constituting said timepiece dial component.

4,404,068

SOLID STATE METHOD FOR SYNTHESIS REACTIONS

Robert A. Huggins, Stanford, and Turgat M. Gur, Palo Alto, both of Calif., assignors to Stanford University, Stanford, Calif.

Filed Apr. 29, 1981, Ser. No. 258,656
Int. Cl.³ C25B 3/00, 11/00, 15/00
U.S. Cl. 204—59 R 15 Claims



1. A method for synthesizing a reaction product comprising the steps of:

providing an electrochemical cell having a first electrode, a second electrode, and a solid state electrolyte intercommunicating said first and second electrodes, said electrolyte adapted to permit ions to flow thereacross;

contacting a first fluid reactant with said first electrode, said first fluid reactant having a first moiety, the contacting including electrochemically separating said first moiety from said first reactant at said first electrode to form an ionic withdrawn first moiety and a first reactant residue and pumping said ionic withdrawn first moiety away from said first electrode and toward said second electrode, the pumping of said withdrawn first moiety including transporting said withdrawn first moiety in said solid state electrolyte; and,

forming a reaction product at said first electrode in the presence of at least a second fluid reactant, said reaction product derived from said first reactant residue and at least said second reactant.

4,404,069

ELECTROLYTIC DESULFURIZATION OF ANILINO SULFUR COMPOUNDS

Richard D. Goodin, St. Louis; John P. Clupp, Kirkwood; Terry M. Balthazor, University City, and James P. Coleman, Maryland Heights, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 17, 1982, Ser. No. 358,771
Int. Cl.³ C25B 3/04; C07C 85/20
U.S. Cl. 204—59 R 17 Claims

1. A process of preparing ortho-alkylanilines which comprises electrolyzing at a cathode an orthoaminobenzyl sulfide, sulfoxide, or sulfone at a cathode potential sufficiently negative to effect reductive cleavage of the sulfur-containing moiety from the benzyl moiety producing an ortho-alkyl aniline.

4,404,070

ELECTROCHEMICAL PRODUCTION OF 2,6-DIAMINOBENZOBISTHIAZOLE

James E. Kuder, Fanwood, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Jul. 23, 1982, Ser. No. 401,437
Int. Cl.³ C25B 3/10
U.S. Cl. 204—72 8 Claims

1. An electrochemical process for the production of 2,6-diaminobenzobisthiazole which comprises subjecting an acidic aqueous medium containing p-phenylenediamine and a thiocyanate salt to electrolysis conditions, adjusting the pH of the acidic medium to at least about 7 with an alkaline reagent, and recovering 2,6-diaminobenzobisthiazole as a precipitated product.

4,404,071

METHOD OF TREATING ELECTROLYTIC SOLUTION OF COPPER FOR PURIFICATION AND REUSE THEREOF

Hideki Abe, Honjyo; Kiyomi Yamaguchi, and Yuzo Asano, both of Kosaka, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 225,135, Jan. 14, 1981, abandoned. This application Apr. 26, 1982, Ser. No. 372,230
Claims priority, application Japan, Jan. 14, 1980, 55-80709
Int. Cl.³ C25R 1/12
U.S. Cl. 204—108 11 Claims

1. A method of treating a spent electrolytic solution containing a major amount of copper and a minor amount of various metal ion impurities containing at least arsenic, which method comprises the steps of:

removing copper from said electrolytic solution in a pretreatment operation until the copper content is greatly reduced but still remains at a level which is substantially larger than the total of said impurities;

passing hydrogen sulfide gas into said pretreated solution at an elevated temperature of 40° C. or higher until the redox potential is at least equal to a certain predetermined value to precipitate substantially all the copper together with said metal ion impurities present in the solution;

filtering the thus treated solution to separate the precipitates as a residue which can be used as part of the raw material

in the process of copper smelting from a filtrate consisting essentially of sulfuric acid; and

returning the filtrate to a copper electrolytic cell for reuse.

4,404,072

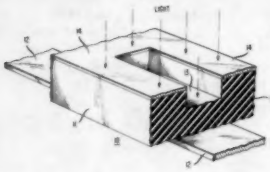
PHOTOELECTROCHEMICAL PROCESSING OF III-V SEMICONDUCTORS

Paul A. Kohl, and Frederick W. Ostermayer, Jr., both of Chatham, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 22, 1981, Ser. No. 275,805

Int. Cl.³ C25F *3/12*

U.S. Cl. 204—129.3 **16 Claims**



1. A process for fabricating a device comprising at least one semi-insulating III–V compound semiconductor, said semi-insulating III–V compound semiconductor having resistivities greater than 10^6 ohm-cm, comprising the step of photoelectrochemically etching the semi-insulating III–V compound semiconductor using an oxidation-reduction reaction in an electrolytic solution characterized in that

a. the oxidation reaction is carried out by illuminating the semi-insulating III–V compound semiconductor with radiation comprising photon energy at least as great as the bandgap of the compound semiconductor so as to produce holes that permit oxidation of the compound semiconductor,

b. the electrolytic solution comprises oxidizing agent with reduction potential in the electrolytic solution between the flat band potential of the Fermi level and the potential of the maximum of the valence band, and

c. the oxidizing agent is reduced on a metallic or p-type surface electrically connected to the III–V compound semiconductor.

4,404,073

PHOTOPOLYMERIZATION OF OLEFINICALLY UNSATURATED MONOMERS UTILIZING BENZIL DIMETHYLACETAL

Alain Bartissol, Clamecy; Jean Boutin, Mions, and Francois Wachowski, Clamecy, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Sep. 3, 1981, Ser. No. 299,223

Claims priority, application France, Sep. 4, 1980, 80 19100

Int. Cl.³ C08F *2/10, 2/50, 2/46*

U.S. Cl. 204—159.23 **14 Claims**

1. A process for the preparation of a high molecular weight water-soluble polymer essentially devoid of residual monomer content and having an increased rate of dissolution, comprising photopolymerizing a thin layer of a deoxygenated aqueous solution of an olefinically unsaturated monomer continuously deposited upon a travelling support substrate, said aqueous solution containing a photopolymerization photoinitiator and said photoinitiator comprising benzil dimethylacetal at from 0.001% to 0.5% by weight based upon the weight of the monomer photopolymerized.

4,404,074

ELECTROLYTIC STRIPPING BATH AND PROCESS

Lillie C. Tomaszewski, Dearborn, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed May 27, 1982, Ser. No. 382,522

Int. Cl.³ C25F *5/00*

U.S. Cl. 204—146 **30 Claims**

1. An electrolytic stripping bath for stripping copper, copper alloy, or chromium deposits from a ferrous basis metal comprising an aqueous solution having a pH of from about 1 to about 14 and consisting essentially of a stripping component selected from the group consisting of (a) a bath soluble primary, secondary, and/or tertiary amine having a carbon content of C_1 to C_8, (b) a bath soluble inorganic nitrate and/or organic nitro compound, and mixtures of (a) and (b); and sodium glucoheptonate present in an effective amount to inhibit attack of the basis metal.

4,404,075

RADIATION CURABLE COATING COMPOSITION COMPRISING THREE OR MORE (METH) ACRYLOYL POLYFUNCTIONAL MONOMER, PHENOL NOVOLAK EPOXY (METH) ACRYLATE OLIGOMER, AND A PHOTOINITIATOR

Junji Ikeda, Ikoma; Keizi Saeki, Kadoma; Tamotsu Wakahata, Katano, and Takao Inoue, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation-in-part of Ser. No. 174,600, Aug. 1, 1980, abandoned. This application Nov. 30, 1982, Ser. No. 445,472

Claims priority, application Japan, Aug. 1, 1979, 54-98942

Int. Cl.³ C08F *2/00*; C09D *3/72*

U.S. Cl. 204—159.23 **10 Claims**

1. A coating composition (B) consisting essentially of:

a composition (A) and

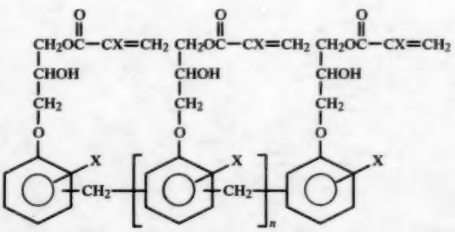
a photopolymerization initiating effective amount of a photoinitiator,

said composition (A) containing:

(i) 80 to 90% by weight of at least one polyfunctional monomer having three or more (meth)acryloyloxy radicals per molecule,

(ii) 5 to 10% by weight of at least one acrylic monomer having two or less functional groups and

(iii) 5 to 10% by weight of a phenol novolak epoxy (meth)acrylate oligomer of the formula:



where,

X=H, CH_3,

X=H, CH_3, Br and

n=0–8

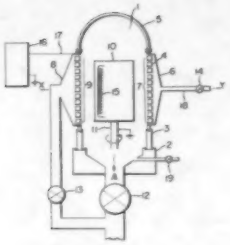
with the proportion of oligomer wherein n of $4 \leqq n \leqq 8$ is more than 20 wt% with respect to the total amount of the novolak epoxy (meth)acrylate.

4,404,076

FILM FORMING PROCESS UTILIZING DISCHARGE

Katsumi Nakagawa, Tokyo, and Tadaji Fukada, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 105,778, Dec. 20, 1979, abandoned. This application Aug. 27, 1982, Ser. No. 412,076
Claims priority, application Japan, Dec. 28, 1978, 53-165848
Int. Cl.³ C23C 13/08, 11/00; H01L 31/15
U.S. Cl. 204—164 6 Claims



1. A film forming process utilizing glow discharge which comprises positioning a drum shaped substrate for forming a film on a fixing member in a pressure-reducible deposition chamber so that a film-forming surface of the substrate is substantially parallel to a discharge surface of an electrode which is spaced around the substrate; reducing the pressure in the deposition chamber to a predetermined pressure; introducing a gas containing a source of silicon for forming an amorphous silicon film into said deposition chamber from a gas inlet, directing said stream substantially perpendicular to the central axis of said substrate; generating a glow discharge between said electrode and said substrate to decompose said gas and to form at least a substantially uniform film of the resulting amorphous silicon on the film forming surface of the substrate and exhausting unused gas from said deposition chamber through a gas outlet opposed to said gas inlet.

4,404,077

INTEGRATED SPUTTERING APPARATUS AND METHOD

Paul R. Fournier, 1027 San Andres #2, Santa Barbara, Calif. 93101

Continuation-in-part of Ser. No. 251,871, Apr. 7, 1981, abandoned. This application Mar. 8, 1982, Ser. No. 355,853
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 30 Claims

1. An integrated sputtering means comprising

means defining a housing having a first cavity and a second cavity spaced a predetermined distance from said first cavity and means for defining a predetermined path which extends between said first cavity and said second cavity;

means for mounting in the interior of the housing defining means an ion target formed of at least one selected material, said ion target being positioned in said interior of the housing defining means with a selected surface of said ion target positioned contiguous said predetermined path and between said cavities thereby forming a lower boundary for said predetermined path, at least one of said mounting means and said ion target including means for containing electrons adjacent the ion target selected surface;

an electron emitter positioned in one of said first cavity and said second cavity;

an electron collector positioned in the other of said first and said second cavity; and

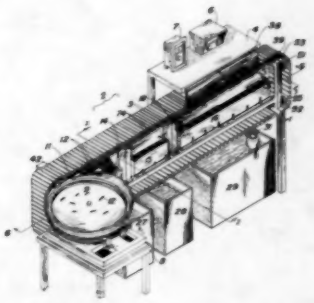
magnetic means positioned along said predetermined path and located in a predetermined spaced relationship from said selected surface for producing lines of magnetic flux which define a B field wherein the direction of the B field of the magnetic means is oriented in a predetermined direction relative to said first and second cavities and to said predetermined path adjacent said selected surface to produce a controlled magnetic field of flux having substantially linear shaped lines of force which define a magnetic flux pattern having at least one selected flux density adjacent said selected surface, said selected surface of said ion target, said electron containing means and said substantially linear lines of flux define a plasma containment envelope which entraps and contains a plasma adjacent said selected surface to obtain controlled uniform target erosion.

4,404,078

LOOSE PARTS PLATING DEVICE

William L. Francis, 18 Chimney Wood, Floyd Knobs, Ind. 47119

Filed Feb. 18, 1982, Ser. No. 349,764
Int. Cl.³ C25D 17/06, 17/28
U.S. Cl. 204—202 7 Claims



1. Apparatus for continuous electroplating of selected portions of elongate metallic articles including a moving conveyor including pivotably connected conveyor plates to form said conveyor and sprocket means disposed at first and second ends of said conveyor in the path of travel of said conveyor whereby said conveyor means is moved wherein said plates have aperture means therein; feeder means to supply said articles to said apertures in generally upright orientation so that a portion of the articles to be electroplated extend through said conveyor plates; solution cell means disposed beneath said conveyor means to supply a selected level of the solution therein and positioned so that a portion of said articles contact said solution; electrical supply means to supply a selected potential to a first contact means which engages said parts where said articles are in said solution and second electrode means to supply an opposite electrical potential to said solution whereby an electrical circuit is completed from said solution to said first contact means to cause electrical current to flow through said articles to be plated.

4,404,079

PLATING MASK SUPPORT

Hooshang Jahani, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 8, 1982, Ser. No. 346,686
Int. Cl.³ C25D 17/00
U.S. Cl. 204—224 R 3 Claims

1. In combination with a plating system for plating selected portions of a web of material, a masking apparatus comprising:

a support member;

a plurality of support stations on said member at locations

aligned with selected areas on the web of material, which areas are to be protected from plating solution;

a die supporting cavity in each of said support stations; and

masking dies shaped to be removably insertable in said cavities.

4,404,080

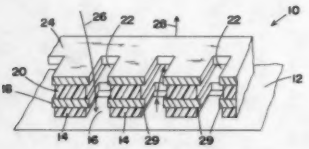
MOLDED PLATING MASK

Hooshang Jahani, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 22, 1982, Ser. No. 360,742

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—224 R **4 Claims**



1. A plating mask having a first resilient layer forming a sealing face for facing contact with a surface to be plated, a backing structure supporting said sealing face, said backing structure comprising first and second planar rigidizing support members with a second resilient layer therebetween, first electrolyte fluid passageways extending through said first and second planar support members and said second resilient layer and said sealing face, to selected areas of said surface, second electrolyte passageways in said second resilient layer generally transverse to, and in communication with, said first passageways, said plating mask formed by the process of molding a resilient material between front and back molds held apart by removable spacers, said front and back molds containing therebetween first and second forms to exclude said resilient material from the passageways, the first forms creating said first passageways and being mounted on said front mold and the second forms creating said passageways and being held in place by being fastened in the first forms, said second planar support member being disposed between said first and second forms.

4,404,081

PHOTOELECTRODIALYTIC CELL

George W. Murphy, 2328 Ashwood, Norman, Okla. 73069, assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Aug. 14, 1981, Ser. No. 292,852

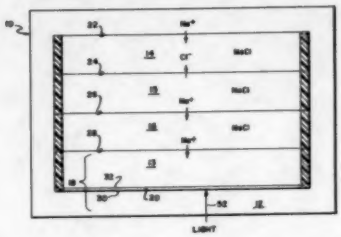
Int. Cl.³ C25B *9/00*; B01D *13/02*

U.S. Cl. 204—253 - **2 Claims**

1. In a multicompartment electrodialytic cell including a wet junction photo cell assembly having at least one electrolyte compartment, the electrodialytic cell further including a product compartment bounded by at least one membrane, said product compartment permitting a concentration of a product therein when energized by an electric field, an improved means for preventing contamination from entering said product compartment, said contamination being contained in said electrolyte compartment, comprising:

a buffer compartment interposed between and immediately adjoining said product compartment and said electrolyte compartment;

first and second semipermeable membranes, each permeable to ions of a first predetermined type and permeable also to said contamination, said first membrane disposed between said product and said buffer compartments, and said second membrane disposed between said buffer and said electrolyte compartments;



said electrolyte compartment is in electrochemical communication with said product and said buffer compartments; and

means for flushing said buffer compartment to prevent said contamination from entering said product compartment.

4,404,082

BIPOLAR ELECTRODE FOR ANODIC PROCESSES IN UNDIVIDED CELLS

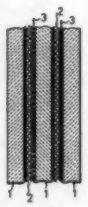
Jürgen Cramer, Eppstein; Rudolf Pistorius, Ober-Mörlen, and Michael Mitzlaff, Bad Homburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,494

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 2825494

Int. Cl.³ C25B *11/12*; C25R *11/04*

U.S. Cl. 204—290 R **10 Claims**



1. Bipolar electrode of carbon, characterized in that the cathode side of said bipolar electrode is covered with metal nets in contact therewith consisting of a material reducing the hydrogen overvoltage.

4,404,083

FLUID BED RETORTING PROCESS AND SYSTEM

Iacovos Vasalos, Downers Grove, Ill., assignor to Standard Oil Company(Indiana), Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,694

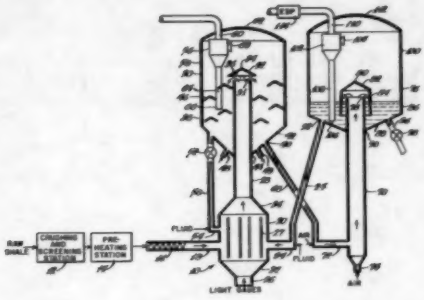
Int. Cl.³ C10G *1/00*; C10B *53/06*

U.S. Cl. 208—8 R **12 Claims**

1. A fluid bed process for use in producing synthetic fuels, comprising the steps of:

commencing retorting of raw solid, hydrocarbon-containing material selected from the group consisting of oil shale, tar

sands, uintaite, lignite and peat in a mixing chamber having a maximum transverse cross-sectional area substantially greater than the maximum transverse cross-sectional area of a vertical lift pipe extending substantially vertically above said mixing chamber by feeding said raw solid, hydrocarbon-containing material and substantially completely combusted solid heat carrier material into said mixing chamber through separate feed lines and injecting a fluidizing lift gas into said mixing chamber separately from said combusted material, in the absence of a sufficient amount of air and molecular oxygen to support



combustion, to fluidize and mix said raw and combusted material in said mixing chamber;

continuing retorting and fluidizing of said raw solid, hydrocarbon-containing material with said substantially completely combusted material and said fluidizing lift gas in said lift pipe located in vertical alignment above said mixing chamber; and

substantially completing retorting of said solid, hydrocarbon-containing material with said substantially completely combusted material in an overhead solids-containing vessel positioned in vertical and coaxial alignment above said lift pipe and said mixing chamber.

4,404,084

COAL HYDROGENATION AND DEASHING IN EBULLATED BED CATALYTIC REACTOR

Derk T. A. Huibers, Pennington, and Edwin S. Johanson, Princeton, both of N.J., assignors to Hri, Inc., Lawrenceville, N.J.

Filed Mar. 11, 1982, Ser. No. 357,230
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **15 Claims**

1. A process for coal hydrogenation and deashing to produce hydrocarbon liquid and gas products, comprising:

(a) mixing particulate coal containing ash with a hydrocarbon slurrying liquid to provide a flowable coal-oil slurry, and feeding the slurry with hydrogen into a reaction zone containing a bed of particulate hydrogenation catalyst;

(b) passing said coal-oil slurry and hydrogen upwardly through said catalyst bed at flow rate sufficient to expand the bed and provide an ebullated bed of said particulate catalyst, maintaining said reaction zone at 750°–900° F. temperature and 1500–5000 psig. hydrogen partial pressure, and at liquid upward superficial velocity and viscosity selected to permit agglomeration of fine ash particles released from the coal, whereby the coal is catalytically hydrogenated and the fine particulate ash is agglomerated to form increased particle sizes and the agglomerated ash is accumulated in an ash layer in the upper portion of the reaction zone above the catalyst bed;

(c) withdrawing said agglomerated ash along with a minimal amount of accompanying reaction zone liquid from said ash layer in said upper portion of said reaction zone;

(d) withdrawing a hydrogenated hydrocarbon effluent material product from the upper portion of said reaction zone above said agglomerated ash layer, and phase separating the effluent material into gaseous and liquid fractions, and

(e) withdrawing deashed hydrocarbon liquid and gaseous products from the process.

4,404,085

DRYING AND DEDUSTING PROCESS

Earl D. York, Engelwood; Milton B. Thacker, Aurora, and Paul B. Miller, Littleton, all of Colo., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 21, 1981, Ser. No. 285,564
Int. Cl.³ C10G *31/06*
U.S. Cl. 208—11 R **48 Claims**

1. A process for dedusting particulate laden oil derived from solid hydrocarbon-containing material, comprising the steps of:

feeding particulate laden heavy oil derived from solid hydrocarbon-containing material into a screw conveyor dryer;

feeding solid heat carrier material into said screw conveyor dryer; and

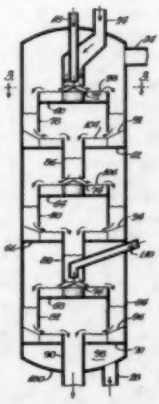
heating said particulate laden heavy oil in said screw conveyor dryer by contacting said solid hydrocarbon-containing material with said solid heat carrier material at a sufficient heating temperature in said screw conveyor dryer to separate said particulate laden heavy oil into a dedusted stream of hydrocarbons containing a substantially lower concentration of particulates than said particulate laden heavy oil and a residual stream containing a higher concentration of particulates than said particulate laden heavy oil.

4,404,086

RADIAL FLOW RETORTING PROCESS WITH TRAYS AND DOWNCOMERS

Robert D. Oltrogge, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 21, 1981, Ser. No. 333,039
Int. Cl.³ C10G *1/00*; C10B *49/06*, *49/10*, *53/06*
U.S. Cl. 208—11 R **24 Claims**



1. A process for retorting oil shale, comprising the steps of:

(a) feeding raw oil shale particles generally downwardly about the vertical axis of an overflow fluid bed retort against a conical portion of a baffle located generally along the vertical axis of said retort;

(b) feeding spent oil shale particles generally downwardly at a temperature greater than the minimum retorting temper-

ature of said row oil shale particles towards said conical portion of said baffle, concurrently with step (a);

(c) deflecting said raw and spent oil shale particles generally downwardly and radially outwardly off said conical portion into a radially outwardly moving fluid bed lying above a tray;

(d) overflowing said particles in said radially outwardly moving fluid bed over an upwardly extending mouth of and into at least one internal peripheral downcomer extending above said tray;

(e) radially moving said fluid bed generally outwardly above said tray from said conical portion to said peripheral downcomer in response to said overflowing in step (d);

(f) gravitatingly moving said particles downwardly through said peripheral downcomer to a radially inwardly moving fluid bed lying above another tray located below said first mentioned tray;

(g) overflowing said particles in said radially inwardly moving fluid bed over an upwardly extending mouth of and into a central downcomer generally along the vertical axis of said retort at a location above said other tray;

(h) radially moving said fluid bed generally inwardly from said peripheral downcomer over said other tray to said central downcomer in response to said overflowing in step (g);

(i) gravitatingly moving said particles downwardly through said central downcomer;

(j) repeating steps (c) through (i) for a plurality of trays for a sufficient time to liberate hydrocarbons from said oil shale particles;

(k) injecting fluidizing gas generally upwardly into said overflow retort separate and apart from said spent shale particles and in a direction generally opposite the feed direction of said spent shale particles to fluidize a substantial amount of said particles in said beds while preventing combustion in said retort and to strip and transport said liberated hydrocarbons upwardly and away from said particles into an outlet above said beds;

(l) conveying said particles from said retort to a combustor lift pipe; and

(m) fluidizing, combusting and transporting said particles generally upwardly through said lift pipe with an oxygen-containing combustion-sustaining gas to provide spent oil shale particles for step (b).

4,404,087

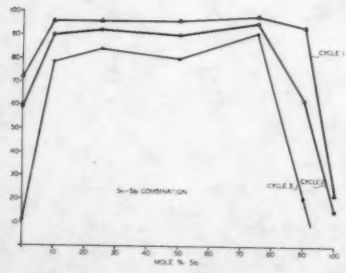
ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Larry E. Reed; Randall A. Porter; Floyd E. Farha, Jr., and Jack P. Guillory, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 348,614, Feb. 12, 1982, abandoned. This application Sep. 30, 1982, Ser. No. 424,889

Int. Cl.³ C10G 9/16

U.S. Cl. 208—48 AA **43 Claims**



1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a combination of tin and antimony, a combination of germanium and antimony and a combination of tin and germanium.

4,404,088

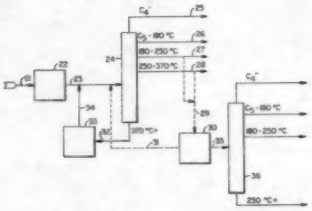
THREE-STAGE HYDROCRACKING PROCESS

Robert W. Bachtel, El Cerrito, and Dennis R. Cash, Novato, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 2, 1981, Ser. No. 307,901

Int. Cl.³ C10G 47/16

U.S. Cl. 208—59 **4 Claims**



1. A three-stage hydrocracking process adapted for maximizing the yield of naphtha, or of maximizing the yield of certain other distillate fractions from a feedstock containing hydrocarbons boiling at temperatures greater than about 360° F. (180° C.), comprising the steps of:

(a) contacting said feedstock in a first hydroprocessing zone with a first hydroprocessing catalyst under conditions comprising a temperature of about 650°–850° F., a total pressure of about 1000–3000 psig, a hydrogen supply of about 500–2000 SCF per barrel of feedstock and a LHSV of 0.3–2.5,

(b) fractionating the effluent from said first hydroprocessing zone in a fractionating zone into a first fraction consisting of naphtha and lower boiling components, a second fraction, the residuum, consisting of components having a normal boiling point greater than about 700° F., and a third fraction, the middle and heavy distillate, consisting of the remainder of the effluent of said first hydroprocessing zone,

(c) contacting said second fraction in a second hydroprocessing zone with a hydrocracking catalyst under hydrocracking conditions comprising a temperature of about 600°–850° F., a total pressure of about 1000–3000 psig, a hydrogen supply of about 500–1500 SCF per barrel of feed and a total LHSV of about 0.8–3.0,

(d) recycling the effluent of said second hydroprocessing zone to said fractionation zone,

(e) contacting said third fraction in a third hydroprocessing zone with a zeolite-containing hydrocracking catalyst of higher cracking activity than the catalysts of said first and second hydroprocessing zones, under hydrocracking conditions comprising a temperature of about 550°–850° F., a total pressure of about 800–2500 psig and a hydrogen supply of about 300–1000 SCF per barrel of feedstock, and

(f) recycling at least a portion of the effluent from said third hydroprocessing zone to said fractionation zone.

4,404,089

PROCESS FOR THE REDUCTION OF THE EFFECT OF CONTAMINANT METALS IN CRACKING CATALYSTS

Fred S. Zrinscak, Woodbury Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 275,001, Jun. 18, 1981. This application Sep. 29, 1982, Ser. No. 427,330
Int. Cl.³ C10G 11/05
U.S. Cl. 208—120 6 Claims

1. In the process for the catalytic cracking of a gas oil in the absence of added hydrogen over a hydrocarbon cracking catalyst comprising an antimony-containing acidic solid, the improvement which comprises contacting said antimony-containing acidic solid with hydrogen sulfide.

4. A method for passivating contaminating metals upon a hydrocarbon cracking catalyst comprising an antimony-containing acidic solid which comprises contacting said cracking catalyst with hydrogen sulfide.

4,404,090

PASSIVATION OF METAL CONTAMINANTS ON CRACKING CATALYST

Carmen Castillo, Memphis, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 209,073, Nov. 21, 1980, Pat. No. 4,364,848, which is a continuation-in-part of Ser. No. 132,602, Mar. 21, 1980, abandoned. This application Jul. 16, 1982, Ser. No. 399,162
Int. Cl.³ C10G 11/18, 11/05
U.S. Cl. 208—120 7 Claims

1. A process for the fluid catalytic cracking of hydrocarbons using a fluidized cracking catalyst which has been contaminated with a contaminating metal due to the use of said catalyst in a fluidized cracking system, and wherein said catalyst is cycled between a cracking zone, in which said catalyst is contacted at an elevated temperature with a hydrocarbon feedstock containing said metal which deposits on said catalyst, and a regeneration zone, in which carbon is oxidized and thereby removed from said catalyst, said metal being included in the group comprising nickel, vanadium, cobalt or iron, which process comprises contacting said catalyst, prior to the cycling of said catalyst to said cracking zone, with a gas or mixture of gases comprising hydrocarbons selected from the group consisting of hydrocarbons containing one, two and three carbon atoms which has been saturated with water at ambient pressure and a temperature from about 120° F. to about 212° F., said contacting occurring at passivation reactions conditions selected so as to first effect substantially complete reduction of said metal to its metallic state and then deactivation of said metal in its metallic state by carbonization.

4,404,091

TREATMENT OF SHALE OILS

Lillian A. Rankel, Plainsboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,939
Int. Cl.³ C10G 9/00, 31/00
U.S. Cl. 208—131 19 Claims

1. An improved process for the treatment of shale oil to remove contaminants therefrom, comprising the steps of:

(a) admixing the shale oil with preformed, normally solid carbonaceous material; and

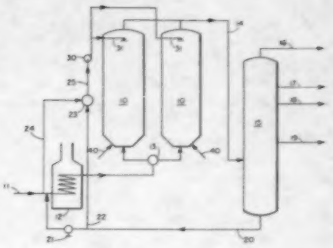
(b) subsequently thermally treating the mixture under delayed coking conditions to produce distillate products having reduced amounts of contaminants, wherein the reduction in contaminants is substantially greater than the reduction obtained by carrying out the thermal treatment in the absence of said preformed, normally solid carbonaceous material.

4,404,092

DELAYED COKING PROCESS

Costandi A. Audeh, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,483
Int. Cl.³ C10G 9/14
U.S. Cl. 208—131 7 Claims



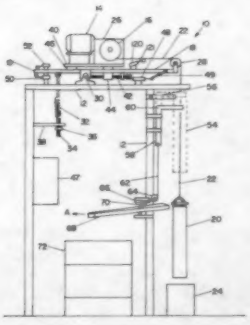
1. In a delayed coking process in which a heated heavy hydrocarbon feedstock is introduced into the bottom of a coker drum to form a carbonizing mass at a temperature of at least 450° C. in which the delayed coking reaction occurs to form coke and gas and vapor phase products which are removed from the vapor space above the carbonizing mass through an outlet the improvement which comprises: maintaining the temperature of the vapor space substantially below 450° C. by introducing a quenching liquid into the vapor space of the coker drum in the region of the outlet, whereby the temperature of vapor space is maintained at its lowest in the region of the outlet and at its highest in the region of the interface with the carbonizing mass and liquid products are obtained in improved yield.

4,404,093

AUTOMATIC WELL SKIMMER

Donald L. Moyer, Hummelstown, Pa., assignor to R. E. Wright Associates, Inc., Middletown, Pa.

Filed Jun. 8, 1982, Ser. No. 386,346
Int. Cl.³ B02B 15/08
U.S. Cl. 210—138 9 Claims



1. An automatic well skimmer for removal of floating contaminates from water wells comprising:

a supporting structure adjacent to a well;

a horizontal balance beam mounted upon the supporting structure and pivoting upon a fulcrum;

a motor and a winch mounted upon the balance beam;

adjustment means attached to the balance beam and capable of compensating for forces acting upon the balance beam to attain a balance under a variety of force conditions;

a pulley attached to one end of the balance beam;

a cable wound upon the winch and routed over the pulley and vertically downward at the end of the balance beam;

an open top bailer attached to the end of the cable and including unloading means;

stop means attached to the supporting structure and engaging the bailer to prevent raising the bailer beyond a certain point;

first electrical signaling means mounted adjacent to and acted upon by the balance beam, providing a first electrical signal when the bailer weight is reduced by flotation within the well and a second electrical signal when the bailer weight is subsequently increased to a selected weight as liquid enters the bailer;

second electrical signaling means acted upon by the bailer and providing a third electrical signal when the bailer engages the stop means;

motor reversing means connected to the motor; and

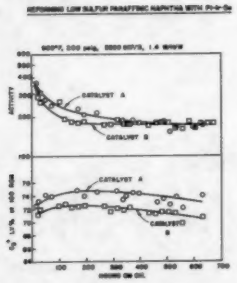
a control system, interconnected with the first electrical signaling means, the second electrical signaling means, the motor, and the motor reversing means, and comprising: first control means to initiate incremental lowering of the bailer within the well in increments which are a fraction of the total length of the bailer upon receiving the first electrical signal; second control means to reverse the motor and initiate raising the bailer to the surface upon receiving the second electrical signal; and third control means to initiate lowering of the bailer within a first preset time after receiving the third electrical signal.

4,404,094

CATALYTIC REFORMING PROCESS

Paul E. Eberly, Jr., and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 2, 1982, Ser. No. 394,718
Int. Cl.³ C10G *35/085*
U.S. Cl. 208—139 **7 Claims**



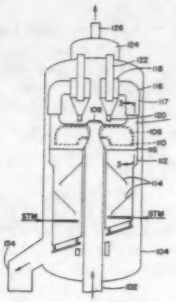
1. In a process for reforming a hydrocarbon feed at reforming conditions which comprises contacting said feed with a catalyst which comprises a platinum component, an iridium component, a component selected from the group consisting of copper, selenium and sulfur, and a halogen component, the improvement wherein the catalyst is contacted with dry hydrogen or a dry hydrogen-containing gas at temperatures ranging from about 600° F. to about 1000° F., at a hydrogen partial pressure ranging from about 1 atmosphere to about 40 atmospheres, at a flow rate sufficient to maintain the moisture level in the exit gas below about 500 ppm, and maintaining said contact for a period ranging at least 16 hours to increase the activity or selectivity, or both, as contrasted with a catalyst composition otherwise similar except that it has not been so-treated.

4,404,095

METHOD AND MEANS FOR SEPARATING GASEOUS MATERIALS FROM FINELY DIVIDED CATALYST PARTICLES

James H. Haddad, Princeton Junction, and Frederick J. Krambeck, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,843
Int. Cl.³ C10G *11/18*; F27B *1/20*
U.S. Cl. 208—161 **21 Claims**



1. In a process for the fluid catalytic cracking of mineral oil whereby the mineral oil is catalytically cracked by passing a suspension of mineral oil and catalyst through a riser conversion zone under cracking conditions into a disengaging vessel and the catalyst recovered from said riser conversion zone is thereafter regenerated to remove carbonaceous deposits before return of the regenerated catalyst to said riser conversion zone and whereby the mineral oil-catalyst suspension is separated upon discharge from the riser conversion zone by

(a) discharging the suspension outwardly through an opening in the upper periphery of the riser and through a radially extending restricted passageway having an opening in the bottom side thereof whereby a substantially confined catalyst stream discharges in a downward direction generally separate from the cracked mineral oil vapors, said restricted passageway curved downwardly adjacent the outer end thereof to induce a downward movement on said confined catalyst stream in said passageway sufficient to direct said stream downwardly into the open upper end of a catalyst stripping passageway positioned beneath said outer end to maintain catalyst so collected and directed separate from said discharged cracked mineral oil vapors and

(b) passing the cracking mineral oil vapors through the disengaging vessel to the upper portion thereof and into the entrance of a cyclone separation means,

the improvement which comprises: discharging the cracked mineral oil vapors from the outer extremity of the radially extending restricted passageway to a vertically disposed elongated restricted passageway in fluid communication with the inlet of a first cyclone separation means whereby the cracked mineral oil vapors are directed from the outer extremity of the radially extending restricted passageway into the first cyclone separation means.

9. An apparatus for separation of catalyst particles from gasiform material which comprises:

(a) a disengaging vessel serving as a reservoir for collected catalyst particles,

(b) a vertically disposed elongated tubular conduit having an upstream end and a downstream end, the latter terminating within said vessel,

(c) a radially extending restricted passageway having an inlet communicating with said elongated tubular conduit at said downstream end and an opening along the bottom

of said radially extending restricted passageway, said bottom opening adapted to discharge catalyst particles in a downward direction as a substantially confined catalyst stream,

(d) a first cyclone separation means adapted to separate entrained catalyst from gasiform material, to discharge separated catalyst into said disengaging vessel and to discharge said gasiform material external to said disengaging vessel,

(e) a vertically disposed catalyst stripping passageway positioned below and in open communication with the bottom opening of the radially extending restricted passageway and adapted to receive the substantially confined catalyst stream into its upper end, and

(f) a vertically disposed elongated restricted passageway in direct fluid communication with the upper end of the catalyst stripping passageway and the inlet of the first cyclone separation means and in open fluid communication with the bottom opening of the radially extending restricted passageway, said vertically disposed restricted passageway surrounding and containing said radially extending restricted passageway in spaced relationship thereto.

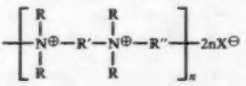
4,404,096

DEMULSIFICATION OF BITUMEN EMULSIONS USING IONENES

David R. McCoy, and Edward E. McEntire, both of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,459
Int. Cl.³ C10G *33/04*
U.S. Cl. 208—188 **6 Claims**

1. A process for recovering petroleum from O/W bitumen emulsions by demulsifying said emulsions comprising contacting the emulsions at a temperature of from between about 25° and 160° C. with ionenes having the general structure



where the identity of the terminating groups is a tertiary amine or organo halo group, wherein R′ and R″ equal alkylene groups, cyclo aliphatic groups, ethers, amides and urea linkages and wherein R is a lower alkyl, X is an anion, and wherein the ionene has an average molecular weight greater than about 2,000 and the presence of greater than 5 meq/g quaternary amine in the neat polymer.

4,404,097

RESIDUA DEMETALATION/DESULFURIZATION CATALYST AND METHODS FOR ITS USE

Philip J. Angevine, West Deptford, and Stephen M. Oleck, Moorestown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 187,685, Sep. 16, 1980, Pat. No. 4,328,127. This application Sep. 18, 1981, Ser. No. 303,335
Int. Cl.³ C10G *45/04*
U.S. Cl. 208—210 **6 Claims**

1. In a process for catalytically demetalizing and desulfurizing a residual oil by contacting said oil with hydrogen under hydrotreating conditions in the presence of a catalyst comprising a hydrogenating component selected from the group of oxides or sulfides of at least one Group VIB or Group VIII metal composited with an alumina base which comprises theta or delta phase alumina and which composite has a surface area of 40–150 m^2/g, a pore volume of 0.45–1.50 cc/g, and has not less than about 60% of its pore volume in pores with diameters of about 100 A to about 200 A; the improvement which comprises using as said catalyst one which is a composite having about 40 to 75% of its pore volume in pores with diameters of about 150 A to about 200 A and up to about 5% of its pore volume in pores with diameters greater than about 500 A.

4,404,098

MERCAPTAN EXTRACTION PROCESS WITH RECYCLED ALKALINE SOLUTION

George Asdigian, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 259,296, Apr. 30, 1981, Pat. No. 4,362,614. This application Dec. 6, 1982, Ser. No. 446,894
Int. Cl.³ C10G *19/02, 19/08*
U.S. Cl. 208—235 **12 Claims**

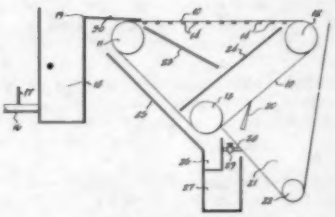
1. In a process for the removal of mercaptans from a hydrocarbon stream in which the feed stream is contacted with an alkaline solution comprising water and an alkaline reagent in an extraction zone to effect transfer of mercaptans from the feed stream to the alkaline solution; the resultant mercaptan-containing alkaline solution is heated and contacted with oxygen in an oxidation zone in the presence of an oxidation catalyst to effect oxidation of mercaptans to disulfides; the resultant disulfides are separated from the alkaline solution by decantation; and a stream of alkaline solution is contacted with a gas stream under conditions which promote transfer of water into the gas stream: the improvement which comprises contacting a portion of the heated mercaptan-containing alkaline solution with the gas stream prior to passing the portion directly into the oxidation zone.

4,404,099

SLUDGE THICKENING

Eric P. Austin, Sandbach, England, assignor to Simon-Hartley Limited, Staffordshire, England

Continuation-in-part of Ser. No. 148,479, May 9, 1980, abandoned, which is a continuation of Ser. No. 969,316, Dec. 14, 1978, abandoned. This application Feb. 1, 1982, Ser. No. 344,878
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—205 **7 Claims**



1. A sludge thickening apparatus comprising means for dosing sludge to be thickened with a floc-producing agent, a tank for receiving and holding the dosed sludge for a sufficient period of time to allow for the development of a floc structure, means comprising a movable, sludge-receiving, liquid permeable band for draining all of the liquid to be removed from the floc-containing sludge solely under the influence of gravity to thicken the sludge without pressing or otherwise disturbing the floc-containing sludge, said band having a sludge-receiving, liquid drainage run which extends at least generally horizontally, means for conveying the floc-containing sludge from said tank to said run in such a manner that said floc structure is retained, means (a) for supporting said band for travel along an endless path and (b) for driving said band for conveying the floc-containing sludge along said run, and means for removing the sludge from the band after the sludge passes beyond said run, said sludge conveying means comprising (a) a weir located at a level lying above the level of said run and (b) a chute for delivering sludge from said weir to said run, said weir constituting a sludge outlet for said tank and having a discharge edge

located at and at the same level as an upstream end of said chute for discharging the floc-containing sludge from said tank directly onto said chute, said chute being inclined relative to said run such that the angle included between said chute and said run is at an acute angle not exceeding approximately 5 degrees, and said chute extending directly from said discharge edge to nearly the level of said run immediately adjacent to said run for gently depositing the floc-containing sludge on said run, the slope of said chute being sufficiently shallow to deposite the floc-containing sludge on said run without substantial forward velocity relative to that of said run and substantially without change of direction at the region where the sludge is deposited on said run to prevent disturbance of said floc structure, said band providing for the gravity drainage of liquid from the sludge as the sludge is conveyed along said run.

4,404,100

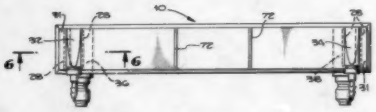
HEMODIALYZER WITH PLEATED MEMBRANE

Adel A. Mikhail, Bloomington, Minn., assignor to Medical Incorporated, Inver Grove Heights, Minn.

Continuation of Ser. No. 149,303, May 13, 1980, abandoned. This application May 5, 1982, Ser. No. 374,973

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—232 **11 Claims**



8. A device comprising:

a substantially rigid case including a preformed shell member having inlet and outlet ports and at least one preformed generally triangular shaped wedge element, said shell member being divided along a parting line into two parts, said shell member being approximately symmetrical about said parting line, an obtuse apex of said triangular shaped wedge element being positioned at about said parting line, the inner walls of said shell member and said wedge element together defining a generally rectangular cavity, said shell member and said wedge element having two pairs of generally coangularly extending wedgedly coacting surfaces; and

a semipermeable membrane folded in a plurality of pleats and confined within said cavity, a last pleat of said membrane extending over an acute apex of said triangular shaped wedge element and between a first pair of said coacting surfaces terminating short of said parting line in an edge which extends generally parallel to said parting line, one of said first pair of coacting surfaces including a first valley means for receiving said edge and encapsulating the entire length of said edge in a body of initially flowable cured in situ adhesive to seal said edge and first pair of coacting surfaces, said first valley means being spaced from and extending generally parallel to said parting line and extending for at least the entire length of said edge, one of said second pair of coacting surfaces including a second valley means for receiving a body of initially flowable cured in situ adhesive to seal said second pair of coacting surfaces, said second valley means being spaced from and extending generally parallel to said parting line and extending for the entire length of said second coacting surfaces, said first and second valley means being disposed on opposite sides of said parting line, and means associated with each of said first and second valley means for guiding on adhesive scraper along said valley means.

4,404,101

EXTRACTION DEVICE FOR REMOVING LIQUID FROM A LIQUID-SOLID MIXTURE

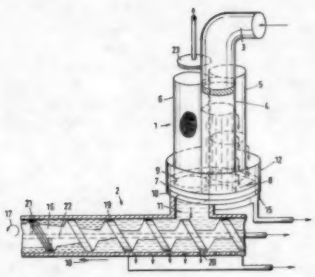
Klaus Koch; Hans-Joachim Schaeffer, both of Laatzen, and Gerhard Syrbius, Grossburgwedel, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 376,103

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118715; Oct. 10, 1981, 3140341

Int. Cl.³ B01D *23/20, 33/18*

U.S. Cl. 210—232 **16 Claims**



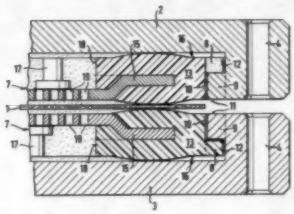
1. An extraction device for extracting solid matter from a solid-liquid mixture such as sewage sludge or paper pulp, said device comprising a preliminary treatment station, said treatment station including mixture feed means and mixture outlet means, and an extraction device located downstream of, and in fluid flow communication with, said outlet means of said preliminary treatment station, said preliminary treatment station comprising a plurality of perforated containers, each said container having an open first end and an open second end, each said first end being alignable with said mixture feed means, a receiver turntable supporting said second end of each said container, a plurality of through aperture defining means formed in said turntable, said second end of each said container being located in a respective one of said through aperture defining means, drive means associated with said turntable for displacing said first end of each said container into alignment with said mixture feed means, stationary disc means concentrically disposed beneath said turntable, eccentrically disposed aperture defining means formed in said disc means, said through aperture defining means in said turntable being alignable, by said drive means, with said aperture defining means in said disc means, the cross-sectional area of said second end of each said container corresponding to the cross-sectional area of said aperture defining means in said disc means, collection means associated with said disc means for collecting separated liquid passing through the perforations in said perforated container, and discharge means in fluid flow communication with said collection means for discharging said separated liquid.

3. A device as recited in claim **1** wherein said perforated containers are each detachably located in said aperture defining means in said turntable so as to be replaceable or interchangeable and mixture inlet means are formed in said extraction device, said container being cylindrical, conical, oval or rectangular in shape, said eccentrically disposed aperture defining means in said disc means and said mixture inlet means corresponding, in both shape and cross-sectional area, to said shape and cross-sectional area of said second end of said containers.

4,404,102
FILTRATION APPARATUS FOR FLAT FILTER PLATES CUT TO SIZE

Günter Pradel, and Ulrich Quaschning, both of Göttingen, Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,506
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 8102504[U]
Int. Cl.³ B01D *35/02*
U.S. Cl. 210—247 **13 Claims**



1. Filtration apparatus for holding a flat filter plate comprising:

(a) a casing comprising an upper part with an inlet and a fluid chamber, and a base part with an outlet and a further fluid chamber;

(b) each casing part having a permeable filter support which delimits the fluid chamber for the fluid, in which structure the flat filter plate can be inserted in a sandwich-like manner between the opposite surfaces of the filter supports of the two casing parts;

(c) both fluid chambers with inclusion of the flat filter plate being sealed against each other in a leakproof manner by at least one circumferential seal arranged in the area of the periphery of the casing parts, and both casing parts being tightened in sealing manner by detachable tightening means;

(d) the filter support being provided in the form of a disc with circular perforation;

(e) the circumferential seal being provided at its peripheral edge with several radially arranged fastening means.

(f) the casing part being provided at the periphery of the fluid chamber holding the filter support with mating means corresponding to the radially arranged fasten means of the filter support;

(g) the corresponding radially arranged fastening means and mating means engage one another to join the filter support and the casing part axially and radially.

4,404,103
ROCKING SWIVEL HOSE CONNECTORS AND METHOD

Edwin H. Drath, 1218 S. Patton, Arlington Heights, Ill. 60005

Filed Nov. 5, 1981, Ser. No. 318,558
Int. Cl.³ F16L *27/06*; B01D *35/02*
U.S. Cl. 210—446 **32 Claims**

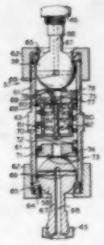
1. A rocking swivel hose connector, comprising:

a body having a passageway therethrough extending in part through axially outwardly facing shoulder means therein spaced inwardly from one end of said body and providing a bottom for a chamber which opens through said one end;

a spherical rocking and swivel member within said chamber and thrusting toward said shoulder means and having a hollow coupling stem thereon which projects outwardly relative to said one end of the body;

said member and said stem having a fluid passage therethrough in continous fluid flow communication with said passageway;

means for retaining said member in assembly within said chamber and permitting rocking and swivelling of said member and said projecting stem, and comprising a flanged clamping ring nut threadedy engaged on said one end of the body, and a combination packing ring and nut lock compressed by said ring nut sealingly against an



annular surface at said one end of said body and against the spherical surface of said rocking and swivel member and lockingly retaining said ring nut relative to said body; and bearing means facilitating rocking and swivelling movement of said member relative to said shoulder means.

4,404,104
CATIONIC ADSORPTION AGENT

Rudolf F. Wurster, Pfeffingen, and Jürg Merz, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 162,275, Jun. 23, 1980, Pat. No. 4,316,005. This application Sep. 11, 1981, Ser. No. 301,154
Claims priority, application Switzerland, Jun. 28, 1979, 6036/79; Feb. 4, 1980, 869/80
Int. Cl.³ B01D *15/04*
U.S. Cl. 210—684 **15 Claims**

1. A process for the removal of an anionic substance from an aqueous solution, which process comprises bringing said solution into contact with a cationic adsorption agent which has been obtained by reaction of

(a) an amino compound which contains at least one amino group and at least one free or methylolated carboxamide group, with

(b) an aminoplast precondensate which does not contain an amino group, in a ratio of 1 mole of component (a) per 0.2 to 10 moles of component (b), in an aqueous medium at a pH value between about 2 and 7.

4,404,105
PROCESS FOR TREATMENT OF WASTE

Serge H. Rysman de Lockerente, Alsemberg, and Norbert Van de Voorde, Mol, both of Belgium, assignors to Societe Internationale de Publicite et d'Agences Commerciales, Brussels, Belgium

Continuation of Ser. No. 873,440, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 704,481, Jul. 12, 1976, abandoned. This application Oct. 2, 1981, Ser. No. 308,177
Claims priority, application Belgium, Jul. 16, 1975, 158349
Int. Cl.³ C02F *1/52, 11/14*
U.S. Cl. 210—710 **36 Claims**

1. A process for the formation of a chemically stable solid aggregate of wastes containing at least one heavy metal or heavy metal compound which is at least partially water soluble under acid conditions comprising the sequential steps of:

(a) forming a low-polymerization-silicic-acid of molecular weight not exceeding 50,000 by reacting

(i) a silicate selected from at least one of the group consisting of alkaline earth metal silicates, aluminum silicates, and aluminosilicates,

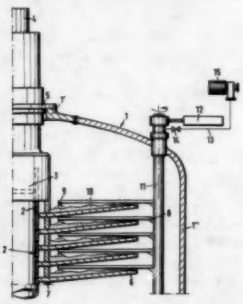
(ii) water, and
(iii) acid sufficient to provide the reaction mixture with a pH between about 0.5 and about 3;
(b) mixing
(i) the wastes containing heavy metals or heavy metal compounds, and
(ii) the low-polymerization-silicic-acid, with
(iii) sufficient water and acid, to adjust the mixture to one having at least 70% dissolved solids and a pH of less than 4;
(c) synthesizing a higher-polymerization-silicic-acid/hydrated-heavy-metal coprecipitate gel, by reacting
(i) the low-polymerization-silicic-acid, and
(ii) the cations of the heavy metal in the wastes,
(iii) in the presence of a base catalyst selected from at least one of the group consisting of sodium hydroxide, potassium hydroxide, calcium hydroxide, their carbonates or hydrocarbonates, in an amount sufficient to increase the pH of the mixture to progressively to at least 7; and
(d) hardening the coprecipitate gel into a chemically stable solid aggregate;
wherein the total amount of water in above steps (a) through (d) is at least 15 percent by weight based upon the total weight of solids.

4,404,106

FILTER APPARATUS AND A METHOD OF CLEANING FILTER ELEMENTS THEREOF

Hans Müller, Erlenbach, and Bruno Guazzone, Rapperswil, both of Switzerland, assignors to Chemap AG, Maennedorf, Switzerland

Division of Ser. No. 77,088, Sep. 19, 1979, Pat. No. 4,276,166, which is a division of Ser. No. 11,950, Feb. 13, 1979, Pat. No. 4,230,576, which is a continuation of Ser. No. 899,176, Apr. 24, 1978, abandoned. This application Jun. 2, 1980, Ser. No. 155,484
Claims priority, application Switzerland, May 9, 1977, 5738/77
The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.
Int. Cl.³ B01D *29/02*
U.S. Cl. 210—772 **10 Claims**



1. A method of cleaning substantially horizontal filter elements having a common vertical axis and provided with a filtering material upon an upper surface of which a cake is deposited during a filtering process and a closed lower surface, the method comprising the steps of providing nozzle elements having a further common vertical axis and horizontal arms located above the upper surface of the filtering material of the filter elements; supplying a cleaning medium to said nozzle elements; ejecting the cleaning medium from said nozzle elements at an adjustable elevated pressure towards said upper surface from above; rotating said filter elements about said first-mentioned axis during ejecting of the cleaning medium towards said upper surface under a desired elevated pressure; and turning the nozzle elements about said further axis relative to said upper surface during ejecting the cleaning medium toward said upper surface so that during the rotation and turning the entire upper surface is overlapped and thereby full removal of the cake from said surfaces and thereupon also full cleaning of the filter material of the filter elements are guaranteed.

4,404,107

WELL WORKING COMPOSITIONS, METHOD OF DECREASING THE SEEPAGE LOSS FROM SUCH COMPOSITIONS, AND ADDITIVE THEREFOR

Jack C. Cowan, Lafayette, La.; Tommy Thrash, Littlefield, Tex., and Jerry R. Rayborn, New Orleans, La., assignors to Venture Chemicals, Inc., Lafayette, La.

Filed Jun. 1, 1981, Ser. No. 269,493
The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.
Int. Cl.³ C09K *7/06, 7/02*
U.S. Cl. 252—8.5 M **8 Claims**

1. Hydrophobic, organophilic, water wettable cotton for use in well working compositions having a particle size such that at least 95% by weight of said cotton present in a 10% by weight water suspension passes through a 100 mesh sieve produced by the process comprising:
(a) reacting raw cotton with dry, gaseous hydrochloric acid in an amount from about 0.3% to about 3% by weight of the cotton at a temperature in the range from about 75° F. to about 180° F.; and
(b) mechanically degrading the cotton.

4,404,108

ADDITIVE FOR DRILLING FLUIDS

Allen E. Cates, 501 Harwell Dr., Lafayette, La. 70503

Filed Sep. 8, 1981, Ser. No. 300,299
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 A **4 Claims**

1. A water-based gas or oil well drilling fluid comprising an aqueous clay dispersion containing, as a thinner and water loss control agent, the essentially water-soluble product obtained by heating together at 100°–150° C. for a period of 120–30 minutes quebracho, lignite, gilsonite and sodium sulfite, paraformaldehyde and sodium hydroxide as sulfonating, methylating and causticizing agents, respectively, the percent by weight proportions of said components being as follows:

	% Solids
Quebracho	15–45%
Lignite	25–45%
Gilsonite	4–15%
Sodium Sulfite	10–25%
Paraformaldehyde	1–10%
Sodium hydroxide	2–10%.

4,404,109

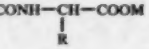
AQUEOUS MICRO-EMULSIONS OF ORGANIC SUBSTANCES

Jacques Tellier; Claude Chambu, both of Billere; Jean-Francois Coste, Muret, and Henri Grangette, Lyons, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

PCT No. PCT/FR79/00103, § 371 Date Jul. 13, 1980, § 102(e) Date Jul. 13, 1980, PCT Pub. No. WO80/00921, PCT Pub. Date May 15, 1980
PCT Filed Nov. 8, 1983, Ser. No. 201,384
Claims priority, application France, Nov. 13, 1978, 70 32005; Oct. 26, 1979, 79 26600
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **15 Claims**

1. A process for the preparation of a micro-emulsion of

hydrocarbon and water which contains at least 60 g of NaCl per liter by the addition of an effective surface active amount of a surface-active agent and a cosurfactant, wherein the said agent is a salt of an N-acyl α-amino acid which corresponds to the formula:



wherein R and R′ are straight-chain or branched aliphatic hydrocarbon radicals or alkyl-aryl radicals, R being C_6 to C_{120}, R′ being C_1 to C_{18} and M being an alkali metal cation, an alkaline earth metal cation, ammonium, an amine group or hydrogen.

4,404,110
OZONATION OF PETROLEUM FEEDSTOCKS

Phillip M. Beazley, Littleton, and Frank L. Dormish, Denver, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 22, 1980, Ser. No. 219,272
Int. Cl.³ E21B *43/22*; C07C *139/00, 143/00*
U.S. Cl. 252—8.55 R **11 Claims**

1. A process for the sulfonation of a petroleum feedstock containing naphthenes and selected from the group consisting of crude oil, topped crude oil, gas oil and mixtures thereof, comprising steps of:

(a) ozonating said petroleum feedstock with about 0.02 to about 2 kilograms of ozone per 100 kilograms of feedstock, at a temperature of about 0° C. to about 100° C. and for a contact time sufficient to prevent excessive oxidation of the resulting ozonated feedstock; and

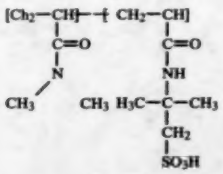
(b) sulfonating said ozonated feedstock with sulfur trioxide under conditions sufficient to sulfonate said ozonated feedstock without excessive oxidation of said ozonated feedstock.

4,404,111
N,N-DIMETHYLACRYLAMIDE/2-ACRYLAMIDO-2-METHYLPROPANE SULFONIC ACID COPOLYMERS FOR ENHANCED PETROLEUM RECOVERY

Le-Khac Bi; Mary E. Dillon, and Clyde Sharik, all of West Chester, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 6, 1981, Ser. No. 232,456
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **1 Claim**

1. In a process for enhancing petroleum recovery from a subterranean petroleum bearing formation which comprises injecting into the formation through an input well an aqueous composition having dissolved therein a polymeric viscosity control agent whereby petroleum is displaced in the formation toward at least one output well, the improvement comprising using as said agent, a random copolymer having a weight average molecular weight greater than about one million having the formula:



said random copolymer being produced by reacting from about 98 to about 99.5 weight percent N,N-dimethylacrylamide with from about 0.5 to about 2 weight percent 2-acrylamido-2-methylpropane sulfonic acid.

4,404,112
HYDROCARBON FOAMS AS WELL STIMULANTS

Gary A. Scherubel, University City, and Michael A. Thorne, Kirkwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 85,182, Oct. 15, 1979, Pat. No. 4,301,868. This application Jul. 8, 1981, Ser. No. 281,452
Int. Cl.³ E21B *21/14, 43/25, 43/267*
U.S. Cl. 252—8.55 B **4 Claims**

1. A composition consisting essentially of an organopolysiloxane-induced hydrocarbon foam mixture, suitable for use in well stimulation, said hydrocarbon being selected from the group consisting of kerosene, #2 diesel oil, well formation condensate and xylene, said siloxane having the formula

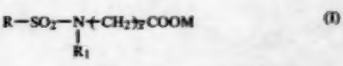
where organo is alkyl and where n has a value sufficient to define a polymer having a molecular weight of from about 5,770 to about 20,000, and being of a concentration of from about 0.5 to about 2% by volume in said hydrocarbon.

4,404,113
COOLING LIQUID WITH CORROSION-INHIBITING AND CAVITATION-INHIBITING ADDITIVES

Heinrich Peters, Burghausen, and Erich Surma, Garching, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

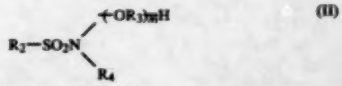
Filed Sep. 14, 1981, Ser. No. 301,735
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035327
Int. Cl.³ C09K *5/00*; C23F *11/16*
U.S. Cl. 252—75 **8 Claims**

1. A cooling liquid with corrosion-inhibiting and cavitation-inhibiting additives consisting essentially of (A) 87–98% by weight of at least one polyhydric alcohol selected from glycerol, alkylene glycols having from 2 to 6 C atoms, or oxyalkylene glycols of oxyethylene or oxypropylene or combinations of oxyethylene and oxypropylene, said oxyalkylene glycols having a total of 4 to 12 carbon atoms; (B) 2–10% by weight of a corrosion inhibitor selected from the benzotrizoles; the alkanolamines and salts thereof; the alkali metal borates, benzoates, nitrites, nitrates, silicates, or phosphates; or mixtures of said corrosion inhibitors; and (C) 0.01 to 3.0% by weight of at least one compound of the formula



(I)

in which R is an alkyl or alkenyl radical having 4 to 25 C atoms or an aryl radical having 6 to 10 C atoms, R_1 is hydrogen or an alkyl radical having 1 to 4 C atoms, M is hydrogen or an alkali metal and x is an integer from 1 to 5, or of the formula



(II)

in which R_2 is an alkyl or alkenyl radical having 4 to 25 C atoms, R_3 is an alkylene radical having 2 to 4 C atoms, n is an

integer from 1 to 10 R_4 is hydrogen, an alkyl radical having 1 to 4 C atoms or a radical $-(OR_5)_mH$, in which R_5 is an alkylene radical having 2 to 4 C atoms and m is an integer from 1 to 10, the weight percentages in each case relating to the weight of the liquid.

4,404,114

ACRYLATE/SILICATE CORROSION INHIBITOR

Paul H. Mohr, Chappaqua, and William N. Matulewicz, Montgomery, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 17, 1982, Ser. No. 389,394

Int. Cl.³ C09K *5/00;* **C23F** *11/12, 11/14;* **C22F** *11/12*

U.S. Cl. 252—75 **35 Claims**

1. An aluminum corrosion inhibitor composition concentrate comprising;

(a) alcohol or water or mixtures thereof;

(b) a polymerizable-acid graft copolymer comprising an unsaturated grafting acid and having a percent acid graft of up to about 60% and a base polymer consisting of a poly(oxyalkylene) compound of the formula: $R''((OC_nH_{2n})_zOR')_a$ wherein R' is a member selected from the group consisting of a hydrocarbon radical, a hydrogen atom, or an acyl radical and R'' is a member selected from the group consisting of a hydrocarbon radical, a hydrogen atom, an amine-containing radical, or an acyl radical, a is an integer having a value of 1 to about 4, n has a value of 2 to 4 inclusive, z is an integer having a value of from 4 to 2300 inclusive, said base polymer having a number average molecular weight of between about 200 and about 100,000, and

(c) a silicate selected from the group consisting of organic silicates, inorganic silicates, and mixtures thereof, and wherein the amount of component (b) is between greater than about 0.01 wt. % and about 20 wt % based on the total amount of component (a) plus component (b) in said concentrate, and wherein the weight ratio of component (b) to component (c) ranges from 8000:1 to 1:20 based on the amount of silicon in component (c).

4,404,115

ENZYMATIC LIQUID CLEANING COMPOSITION

Ho T. Tai, Santes, France, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,961

Claims priority, application United Kingdom, Nov. 13, 1981, 8134310

Int. Cl.³ C11D *3/04, 3/386, 17/08;* **C12N** *9/96*

U.S. Cl. 252—135 **7 Claims**

1. Enzymatic liquid cleaning composition comprising:

(a) from 0.001 to 10% by weight of an enzyme selected from the group consisting of proteolytic, amylolytic and cellulolytic enzymes and mixtures thereof;

(b) from 1 to 15% by weight of an alkalimetal pentaborate;

(c) from 0 to 15% by weight of an alkalimetal sulphite;

(d) from 0 to 15% by weight of a polyol, containing from 2 to 6 hydroxy groups; and

(e) water.

4,404,116

NONCORROSIVE UREA-SULFURIC ACID REACTION PRODUCTS

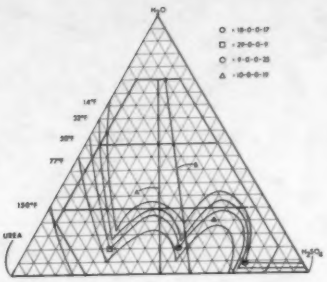
Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 15, 1981, Ser. No. 330,904

Int. Cl.³ C05C *9/00;* **C23F** *11/16, 11/18*

U.S. Cl. 252—182 **12 Claims**

1. A composition of matter comprising about 5 to about 75 weight percent urea, about 5 to about 85 weight percent sulfuric acid and about 0 to about 75 weight percent water in which said urea and sulfuric acid, in combination, constitute at least about 25 weight percent of said composition and in which at least a portion of said urea and sulfuric acid are present as a member selected from the group consisting of monourea sulfate, diurea sulfate, and combinations thereof, containing a



corrosion inhibiting amount of a cupric ion-containing compound sufficient to reduce the corrosivity of said composition to stainless steel.

4,404,117

CORROSION PROTECTION FOR NON-AMALGAMATED ZINC

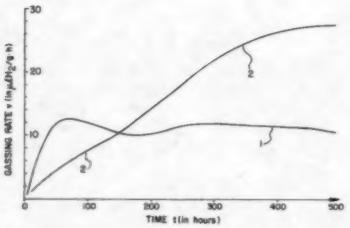
Thorolf Gugenberger, Kelkheim, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 388,089

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128900

Int. Cl.³ H01M *4/26, 4/38, 4/42, 4/54*

U.S. Cl. 252—182.1 **11 Claims**



1. A negative, non-amalgamated zinc powder electrode for galvanic elements with alkaline electrolyte, characterized in that the zinc powder is doped with silver.

4,404,118

REGENERATION OF ADSORBENTS BY LOW TEMPERATURE HYDROGEN STRIPPING

Lily E. Herskovits, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 28, 1981, Ser. No. 334,501

Int. Cl.³ B01J *20/34;* **C10G** *25/12;* **C07C** *7/13, 7/12*

U.S. Cl. 252—411 R **9 Claims**

1. A method of regenerating a solid adsorbent containing oxygenated hydrocarbonaceous impurities, said impurities being existent as a result of treating a process stream comprising a hydrocarbon having less than 12 carbon atoms per molecule with said adsorbent which comprises:

(a) contacting said solid adsorbent with a hydrogen-rich stream for at least one hour at a low temperature below about 200° F. to hydrogenate at least a portion of said

oxygenated hydrocarbonaceous impurities at said low temperature; and then

(b) increasing said low temperature to a high temperature above 400° F. at a uniform rate less than 50° F. per hour to complete regeneration of said solid adsorbent without loss of adsorption capacity.

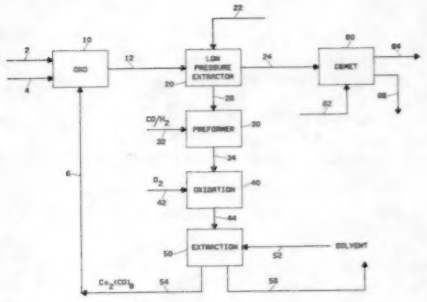
6. The method of claim 1 further characterized in that the process stream comprises olefinic and diolefinic hydrocarbons having less than 6 carbon atoms per molecule.

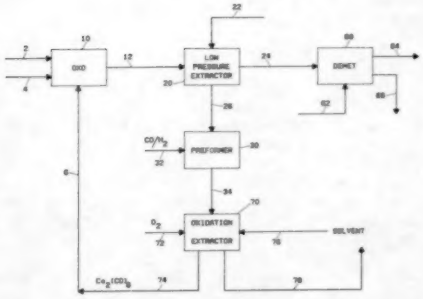
7. The method of claim 1 further characterized in that the adsorbent is a naturally occurring material.

4,404,119
PROCESS FOR RECOVERY OF COBALT OXO CATALYSTS

Linda S. Lagace, and David A. Young, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1981, Ser. No. 333,734
Int. Cl.³ B01J *31/40, 31/20*; C07C *27/22, 45/50*
U.S. Cl. 252—413 23 Claims





1. A process for forming an olefinic liquid containing dissolved dicobalt octacarbonyl suitable for use as feed to an olefin hydroformylation reaction, which comprises contacting an aqueous solution containing a water-soluble tetracarbonylcobaltate salt in an oxidation zone with a molecular oxygen-containing gas in the presence of a liquid olefinic extractant for dicobalt octacarbonyl to oxidize at least a portion of said tetracarbonylcobaltate to dicobalt octacarbonyl; and recovering said olefinic liquid containing dissolved dicobalt octacarbonyl from said oxidation zone, said recovered liquid being substantially free of oxidation by-products formed in said oxidation zone from any portion of said olefinic extractant.

10. An improved process for forming dicobalt octacarbonyl which comprises contacting an aqueous solution containing a water-soluble tetracarbonylcobaltate salt in an oxidation zone with a molecular oxygen-containing gas in the presence of gaseous CO charged thereto, to oxidize at least a portion of said tetracarbonylcobaltate to dicobalt octacarbonyl, the partial pressure of carbon monoxide in said oxidation zone being maintained within the range of from about 10 to 4500 psig and the total pressure provided by carbon monoxide and said oxygen-containing gas being within the range of from about 20 to 4500 psig, whereby improved yields of dicobalt octacarbonyl are obtained; and recovering a liquid phase from said oxidation zone containing said dicobalt octacarbonyl.

14. A process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises:

(a) treating the oxo product in a first demetalling zone with a first aqueous solution of a Co^{++} salt of an organic or inorganic acid to extract at least a portion of the cobalt-containing catalyst residues from the oxo product into a first aqueous phase and to form products including said Co^{++} salt and $Co[Co(CO)_4]_2$ therein;

(b) substantially completing the demetalling of the thus treated oxo product by treatment in a second demetalling zone with an aqueous organic or inorganic acid in the presence of oxygen to form a Co^{++} salt of said acid;

(c) treating said first aqueous phase with synthesis gas in a high pressure reactor at a pressure in the range of from about 15 psig to about 1500 psig and at a temperature in the range of from about 0° to about 200° C., to form a second aqueous solution containing additional quantities of $Co[Co(CO)_4]_2$;

(d) contacting said second aqueous solution in an oxidation zone with molecular oxygen at a temperature of from about 0° to 90° C. to form $Co_2(CO)_8$;

(e) contacting the aqueous effluent of step (d) with an organic solvent to extract said $Co_2(CO)_8$; and

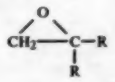
(f) passing said organic solvent extract to an oxo reaction zone as catalyst.

4,404,120
PROCESS FOR PREPARING HYDROXY-CONTAINING AMINE COMPLEXES WHICH ARE USEFUL AS CATALYSTS FOR TRIMERIZING ISOCYANATES AND PREPARING POLYURETHANES

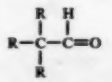
Howard P. Klein, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,138
Int. Cl.³ C08G *18/18*
U.S. Cl. 252—426 13 Claims

1. A process for preparing catalysts for use in the trimerization of isocyanates and the preparation of urethanes from polyols and isocyanates which comprises reacting an amine with an epoxide of the formula



wherein both R's can be hydrogen or an organic radical in the presence of water and an aldehyde of the formula



wherein R is an alkyl, cycloalkylaryl or alkaryl radical or two R's are joined to form an aromatic or heterocyclic radical, and then stripping off the water.

4,404,121

PROCESS FOR PREPARING POLYOL-CATALYST MIXTURES USEFUL IN THE PREPARATION OF RIGID POLYURETHANE CELLULAR PRODUCTS

Howard P. Klein, Houston, and George P. Speranza, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,947
Int. Cl.³ B01J 31/02
U.S. Cl. 252—426 9 Claims

1. A process for preparing polyol-catalyst mixtures useful in the preparaton of rigid polyurethane cellular products which comprises heating a Mannich base compound with water and an epoxide and subsequently removing the water from the reaction mixture, said Mannich base compound being the reaction product of a phenol, an alkanolamine and formaldehyde.

4,404,122

PREPARATION OF SUPPORTED ALKALI METAL BOROHYDRIDE REAGENTS

Robert C. Wade, Ipswich, Mass., assignor to Thiokol Corporation, Chicago, Ill.

Filed Mar. 19, 1982, Ser. No. 360,075
Int. Cl.³ B01J 21/02, 23/04
U.S. Cl. 252—432 11 Claims

1. A method for preparing a supported alkali metal borohydride reagent, comprising: contacting a high surface area solid support material that is essentially non-reactive with alkali metal borohydrides with a solution of an alkali metal borohydride in an anhydrous aprotic solvent so as to form a coating of said solution on the surface of said support material; and then removing the solvent so as to result in a thin residual coating composed predominantly of said borohydride on the surface of said support material.

4,404,123

CATALYSTS FOR PARA-ETHYLTOLUENE DEHYDROGENATION

Chin-Chiun Chu, North Brunswick, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,913
Int. Cl.³ B01J 23/08, 23/16
U.S. Cl. 252—463 4 Claims

1. A dehydrogenation catalyst composition especially suitable for promoting the dehydrogenation of para-ethyltoluene to selectively form para-methylstyrene, said catalyst composition comprising:

a. from about 30% to 60% by weight of iron oxide, calculated as ferric oxide;
b. from about 13% to 48% by weight of potassium compound, calculated as potassium oxide;
c. from about 0% to 5% of chromium compound, calculated as chromic oxide; and
d. from about 1% to 15% by weight of a gallium compound, calculated as gallium trioxide.

4,404,124

SELECTIVE HYDROGENATION CATALYST

Marvin M. Johnson; Darrell W. Walker, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1981, Ser. No. 260,946
Int. Cl.³ C07C 5/08, 7/167; B01J 23/48, 23/82
U.S. Cl. 252—466 PT 9 Claims

1. A catalyst for the selective hydrogenation of acetylene consisting essentially of particles of alpha alumina containing metallic components consisting essentially of palladium and silver wherein the palladium is about 0.01 to about 0.025 weight percent of the catalyst, the weight percent silver is at least twice that of the palladium, the silver is distributed throughout said catalyst particles, and substantially all of the palladium is concentrated in an area within 300 microns of the exterior surface of at least 90 percent of the catalyst particles.

4,404,125

POLYPHENYLENE ETHER RESIN COMPOSITIONS FOR EMI ELECTROMAGNETIC INTERFERENCE SHIELDING

Visvaldis Abolins, Delmar; Richard C. Bopp, Ballston Lake; Joel M. Caraher, Pattersonville, and Eric M. Lovgren, Westerlo, all of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 14, 1981, Ser. No. 311,268
Int. Cl.³ H01B 1/06
U.S. Cl. 252—511 20 Claims

1. A thermoplastic molding composition which comprises:
(a) a polyphenylene ether-styrene resin composition; and
(b) a conductive material selected from the group consisting of aluminum flakes, a combination of aluminum flakes with carbon fibers or conductive carbon black, a combination of carbon fibers and conductive carbon black, and carbon fibers, in an amount sufficient to render the composition when molded shielding against electromagnetic interference.

4,404,126

PREPARATION OF ELECTRICALLY CONDUCTIVE POLYMERIC SYSTEMS

Volker Muench, Ludwigshafen; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,668
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027529
Int. Cl.³ H01B 1/02
U.S. Cl. 252—512 3 Claims

1. A process for the preparation of electrically conductive polyacetylene polymers having conductivities greater than 10^{-2} S/cm, which polymers are substantially stable to oxygen degradation, wherein from 0.1 to 95% by weight of black phosphorus and from 0.5 to 25% by weight of sodium, potassium, rubidium or cesium or their amides, are added, in the absence of moisture and of oxygen, to polyacetylene, the percentages stated being based on the weight of the polymer.

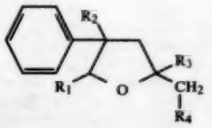
4,404,127

PERFUME COMPOSITIONS AND PERFUMED MATERIALS AND ARTICLES, CONTAINING PHENYL-TETRAHYDROFURANS AS A FRAGRANCE

Antonius J. A. van der Weerdt, Huizen; Roeland Plomp, Almere-Haven, and Willem Apeldoorn, Blaricum, all of Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Oct. 1, 1981, Ser. No. 307,613
Claims priority, application Netherlands, Oct. 6, 1980, 8005518
Int. Cl.³ A61K 7/46; C11B 9/00; C11D 17/00
U.S. Cl. 252—522 R 7 Claims

1. Compounds having the formula



wherein R_1, R_2 and R_3 are selected from the group consisting of H and an alkyl group having 1–3 carbon atoms and R_4 is selected from the group consisting of H, CH_3 and C_2H_5, pro-

viding that R_1, R_2, R_3 and R_4 are not each H and further providing that when R_2 and R_4 are H, one of R_1 and R_3 is not H and the other a methyl group.

4,404,128

ENZYME DETERGENT COMPOSITION

Barry J. Anderson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 29, 1981, Ser. No. 268,215
Int. Cl.³ C11D *1/10, 3/12*
U.S. Cl. 252—546 **5 Claims**

1. A detergent composition substantially free of phosphate materials comprising:

(a) from about 5% to about 40% of a detergent surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic and cationic surfactants and mixtures thereof;

(b) from about 0.005% to about 0.2% of pure proteolytic enzyme;

(c) from about 10% to about 50% of a hydrated sodium Zeolite A; and

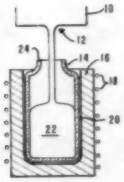
(d) from about 5% to about 30% of a water-soluble nitrilotriacetate, the ratio of the hydrated sodium zeolite A to the water soluble nitrilotriacetate being from about 1:3 to about 3:1.

4,404,129

SEQUESTERING OF RADIOACTIVE WASTE

H. Larry Penberthy, and Dennis J. Hotaling, both of Seattle, Wash., assignors to Penberthy Electromelt International, Inc., Seattle, Wash.

Filed Dec. 30, 1980, Ser. No. 221,376
Int. Cl.³ C09K *3/00, 11/04*
U.S. Cl. 252—629 **9 Claims**



1. A process for sequestering radioactive waste elements oxides in a leach resistant enclosure for prolonged storage comprising:

incorporating the radioactive elements oxides within the structure of a glass by melting said oxides under a batch blanket with suitable glass forming raw materials or premelted frit to form a substantially homogeneous radioactive molten glass having a selected coefficient of expansion;

providing a support mold having an opening and which is lined with inert leach-resistant cladding glass having a thermal expansion characteristic which is sufficiently close to the expansion characteristic of the said radioactive glass to permit annealing and cooling without cracking or spalling;

heating said mold and said cladding glass to at least the temperature at which said cladding glass does not crack excessively when molten glass contacts it during the casting step;

casting said radioactive glass within said cladding glass held in said mold;

sealing the opening in said cladding glass with inert leach-resistant glass to form a mass of radioactive glass clad substantially in inert leach-resistant glass;

annealing and cooling said mass in such a way as to avoid substantial cracking.

4,404,130

PROCESS FOR THE PLUTONIUM DECONTAMINATION OF AN ORGANIC SOLVENT

Richard Fitoussi, Paris, and Claude Musikas, Villebon, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 11, 1981, Ser. No. 242,656
Claims priority, application France, Mar. 13, 1980, 80 05626
Int. Cl.³ G21F *9/06*
U.S. Cl. 252—631 **12 Claims**

1. A process for the plutonium decontamination of an organic solvent, comprising adding to said organic solvent a reducing agent which is soluble therein and consists of a dialkyl dithiophosphoric acid, bringing the organic solvent containing the reducing agent into contact with an acid aqueous solution and separating the aqueous solution containing the plutonium from the decontaminated organic solvent.

4,404,131

METHOD OF PRODUCING A FACTOR-VIII(AHF)-HIGH-CONCENTRATE

Otto Schwarz, and Yendra Linnau, both of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Filed Jul. 29, 1981, Ser. No. 287,912
Claims priority, application Austria, Aug. 27, 1980, 4338/80
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 B **8 Claims**

1. An improved method of producing a factor-VIII(AHF)-high-concentrate having a specific activity of at least 2.5 units AHF and a fibrinogen content of less than 0.25 mg/mg protein from human or animal plasma by a multi-step fractionation of said plasma, in particular by cryoprecipitation and purification by means of protein precipitating agents, such as polyethylene glycol, wherein the improvement comprises subjecting a solution fraction purified by these multi-step fractionation measures and enriched in factor VIII(AHF) to a deepfreezing and thawing operation in the presence of an alcohol and processing the resulting precipitate into a stable form.

4,404,132

BLOOD COAGULATION PROMOTING PRODUCT

Gautam Mitra, Kensington, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 153,396, May 27, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 345,988
Int. Cl.³ C07G *7/00*; **A61K** *35/14, 35/16, 37/02*
U.S. Cl. 260—112 B **4 Claims**

1. A sterile lyophilized storage stable concentrate for controlling bleeding in hemophilia, free of thrombin, heparin, thromboplastin activity, anticomplement activity, depressor activity, and activated Factor X, and containing coagulation Factors II, VII, IX, and X in non-activated form and containing no greater amounts of calcium-activated factors and Factor VIII Inhibitor Bypassing Activity substance than that found in concentrates of Factor II, VII, IX, and XI that have not been treated, respectively, with calcium or a water-insoluble inorganic coagulation-physiologically-surface-active material in the absence of calcium which would produce a Factor VIII Inhibitor Bypassing Activity substance in such concentrates and having a specific activity of at least about 1.5 Factor IX units per milligram of total protein and a Factor IX:Factor VII ratio of at least about 6:1, a Factor IX:Factor II ratio of about 1:1 to 2:1, a Factor IX:NAPTT ratio of at least about 5:1 on a Units per milliliter basis and a Factor II Specific Activity of about 1.0–4.0 Units per milligram of total protein.

4,404,133
PEPTIDES AND METHOD FOR SYNTHESIZING THE SAME

Noboru Yanaihara, Shizuoka, and Koji Kono, Iwaki, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 272,979
Claims priority, application Japan, Jun. 25, 1980, 55-86952
Int. Cl.[3] C07C *103/52*; G01N *33/00*
U.S. Cl. 260—112.5 R 6 Claims

1. A peptide with a primary structure represented by the general formula (I):

X-Ser-Gln-Gly-Gly-Ser-Asn-Y

wherein

(1) X represents H-Tyr-Gln-Ala-Lys and Y represents a hydroxyl group,

(2) X represents pGlu-Ala-Lys(N^{ϵ}-Tyr-H) and Y represents a hydroxyl group, or

(3) X represents pGlu-Ala-Lys and Y represents a Tyr-OH group. with the proviso that (a) —Lys(N^{ϵ}-Tyr-H) means that the amino group at the ε-position of the side chain of lysine has been bonded to tyrosine via a peptide bonding, and (b) pGln means a group formed by removing a hydroxy group of the carboxy group of pyroglutamic acid.

4,404,134
COLLAGEN SPONGE

Udo Becker, Munich; Konrad Braun, Ebsdorfergrund, and Norbert Heimburger, Marburg an der Lahn, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Division of Ser. No. 169,842, Jul. 17, 1980, Pat. No. 4,331,766. This application Feb. 26, 1982, Ser. No. 352,954
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1979, 2929144
Int. Cl.[3] C07G *7/00*
U.S. Cl. 260—112.5 R 2 Claims

1. A collagen sponge prepared by treating collagen-containing human or animal tissue with pepsin to form a pepsin-treated collagen, dialyzing said pepsin-treated collagen at a temperature in the range of 4° C. to 25° C. with a phosphate:buffered isotonic solution containing a basic amino acid at a concentration of 5 to 20 mmols/l to form a collagen solution, and heating said solution to precipitate sponge-forming collagen fibrillae therefrom.

4,404,135
ENKEPHALIN DERIVATIVES

David A. Jones, Evanston, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 284,428, Jul. 20, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 405,975
Int. Cl.[3] C07C *103/52*
U.S. Cl. 260—112.5 E 2 Claims

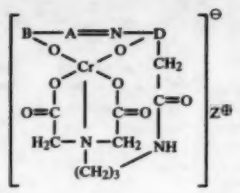
1. 1-[N-[N-[N-(2,6-dimethyl-D-tyrosyl)-D-methionyl]-glycyl]-N-methyl-L-phenylalanyl]-2-pyrrolidinemethanol, monohydrochloride

4,404,136
CHROME COMPLEXED AZO OR AZOMETHINE HEXADENTATE DYES

Elbert M. Idelson, West Newton, and Patrick F. King, Needham, both of Mass., assignors to Polaroid Corporaton, Cambridge, Mass.

Filed Dec. 14, 1981, Ser. No. 330,509
Int. Cl.[3] C07C *107/04*; C09B *45/06, 45/16*; G03C *5/54*
U.S. Cl. 260—147 4 Claims

1. An ortho, ortho'-dihydroxy azo or azomethine dye compound represented by the formula



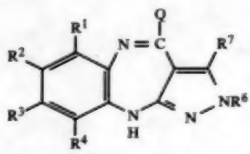
wherein A is —N— or —CH; B is a radical of benzene or naphthalene; D is a radical of benzene, naphthalene, pyrazolone or pyrimidine provided that the methylene group connected to the radical represented by D is attached to the position ortho to that of the oxygen atom; and Z is a cation.

4,404,137
PYRAZOLO [3,4-b][1,5]BENZODIAZEPINE COMPOUNDS

Jiban K. Chakrabarti, Camberley, and Terrence M. Hotten, Farnborough, both of England, assignors to Lilly Industries Limited, London, England

Filed Oct. 2, 1980, Ser. No. 193,200
Claims priority, application United Kingdom, Oct. 16, 1979, 7935846
Int. Cl.[3] A61K *31/55*; C07D *487/04*
U.S. Cl. 260—239.3 T 2 Claims

1. An intermediate compound of formula



in which R^1, R^2, and R^3 independently represent hydrogen, halogen, or C_{1-4} haloalkyl,

R^4 is hydrogen;

in which R^6 is hydrogen, C_{1-6} alkyl, C_{3-7} cycloalkyl, or C_{3-7} cycloalkyl C_{1-4} alkyl

in which R^7 is C_1–C_4 alkyl or hydrogen; and

Q is hydroxyl, thiol or amino.

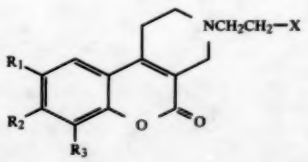
4,404,138
3-[2-(AZABICYCLO) ETHYL]-1,2,3,4-TETRAHYDRO-5H-[1]BENZOPYRANO[3,4-c]PYRIDIN-5-ONES

David T. Connor, Ann Arbor; Charles F. Schwender, Dexter; Roderick J. Sorenson, and Paul C. Unangst, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

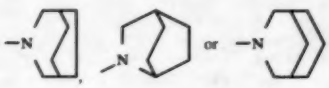
Filed Jun. 22, 1982, Ser. No. 391,197
Int. Cl.[3] C07D *491/052*
U.S. Cl. 260—244.4 19 Claims

1. A compound having the structural formula I

I



wherein R_1 is H, alkyl of from 1 to 6 carbon atoms, alkoxy of from about 1 to 6 carbon atoms, hydroxy, nitro, halo, amino, or C_{1-4} alkanoylamine; R_2 is H, hydroxy, alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms or phenyl; R_3 is H, or alkoxy of from 1 to 6 carbon atoms; R_1 and R_2 taken together are OCH_2O; R_2 and R_3 taken together are CH=CH—CH=CH; X is



and the pharmaceutically acceptable salts thereof, provided that R_1 is not hydroxy when R_2 is OC_2H_5 and X is

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4,404,139

ADDITION PRODUCTS OF TERMINALLY UNSATURATED POLYIMIDE DERIVATIVES WITH A DIARYL CONJUGATED BUTADIYNE

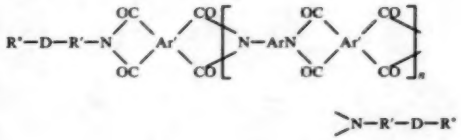
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,615, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,870

Int. Cl.³ C07D 209/34, 471/00; C08F 22/40

U.S. Cl. 548—423 **29 Claims**

1. The Diels-Alder addition product of (1) a conjugated diyne of the formula $Ar^{\circ}C{\equiv}C{-}C{\equiv}CAr^{\circ}$, with (2) an aromatic polyimide dienophile having the formula:



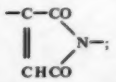
wherein:

Ar° is a monovalent aromatic radical;

Ar' is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to the adjacent carbon atoms in Ar' except in the case of Ar' being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical; and

D is a divalent dienophile group selected from the class consisting of —C(R)=C—, a non-conjugated —C≡C—, and



R is hydrogen or a hydrocarbon or two or three hydrocarbon groups joined by —O—, —S—, —COO—, —OOC— or $—SO_2—$, the hydrocarbon or joined hydrocarbon groups having one to 21 carbon atoms therein;

R' is a divalent hydrocarbon group of 1–12 carbon atoms;

R° is hydrogen or a hydrocarbon moiety containing one to 21 carbon atoms; and

n is zero or an integer having a value of one to 20.

4,404,140

MANUFACTURE OF ALKYLANTHRAQUINONES

William L. Evans, Turnersville, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 26, 1981, Ser. No. 314,869

Int. Cl.³ C07C 49/68

U.S. Cl. 260—369 **10 Claims**

1. A process comprising adding one part by weight of an alkylbenzoylbenzoic acid, wherein the alkyl group contains from 2 to 5 carbon atoms as about a 10 to 40% by weight solution in a suitable solvent, to 7 to 15 parts by weight of 100% sulfuric acid or up to 12% oleum, removing the solvent by distillation at from 20° to 60° C., heating at 80° to 95° C. to cause the corresponding alkylanthraquinone to form, drowning the resulting sulfuric acid or oleum solution in water to dilute the sulfuric acid concentration to from 10 to 40% by weight and separating the alkylanthraquinone from the water.

4,404,141

$\Delta^{9(11)}$- AND Δ^{16}-21-CHLORO-20-KETO STEROIDS OF THE PREGNANE AND D-HOMOPREGNANE SERIES, THEIR PREPARATION AND USE AS INTERMEDIATES FOR THE SYNTHESIS OF HIGHLY EFFECTIVE CORTICOIDS

Klaus Annen; Henry Laurent, and Helmut Hofmeister, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

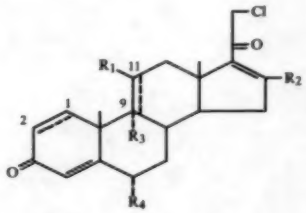
Filed Mar. 9, 1982, Ser. No. 356,615

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3109459

Int. Cl.³ C07J 7/00

U.S. Cl. 260—397.3 **14 Claims**

1. A Δ^{16}-21-chloro-20-keto steroid, of the formula



wherein

$C_1{=}{=}{=}C_2$ and $C_9{=}{=}{=}C_{11}$ each independently is a CC-single or CC-double bond,

R_1 is hydrogen or hydroxy,

R_2 is hydrogen or methyl,

R_3 is hydrogen or fluorine, provided that when R_3 is fluorine, $C_9{=}{=}{=}C_{11}$ is a CC-single bond, and

R_4 is hydrogen, methyl, or fluorine.

4,404,142

PREPARATION OF CORTICOIDS FROM 17-KETO STEROIDS

Jerry A. Walker, Oshtemo Township, Kalamazoo County, and Edward J. Hessler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

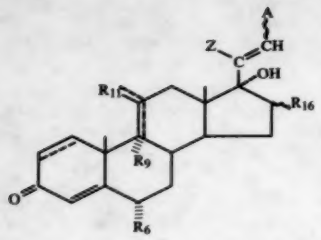
Division of Ser. No. 264,593, May 18, 1981, Pat. No. 4,357,279. This application May 17, 1982, Ser. No. 378,940

Int. Cl.³ C07J 5/00

U.S. Cl. 260—397.45 **39 Claims**

1. A 20-substituted steroid of the formula

(IX)



where

A is a fluorine, chlorine, or bromine atom,

R_6 is a hydrogen or fluorine atom or methyl group,

R_9 is a hydrogen or fluorine atom, hydroxyl group, —O-Si(R)$_3$ or nothing,

R_{11} is (H); (H,H); (H, β-OH); (H, β-OSi(R)$_3$); or O,

R_{16} is a hydrogen atom or methyl group,

Z is —OR_{20} or —SR_{20},

~ indicates the attached group can be either the α or β configuration, and

. . . is a single or double bond.

4,404,143

PROCESS FOR PRODUCING HIGH CONCENTRATION SOLUTION OF SALT OF ALPHA-SULFO FATTY ACID ESTER

Shizuo Sekiguchi; Yozo Miyawaki, and Toshiaki Ogoshi, all of Funabashi, Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,478

Claims priority, application Japan, Jun. 16, 1980, 55-80119

Int. Cl.[3] **C07C** *139/14*

U.S. Cl. 260—400 **7 Claims**

1. A process for producing a high-concentration aqueous solution of the salt of an alpha-sulfo fatty acid ester comprising the steps of:

(a) neutralizing the sulfonated product of a fatty acid ester with an aqueous caustic alkali solution having a concentration of 15 through 50% by weight, in the presence of an alcohol having 1 to 4 carbon atoms in an amount of 5 through 20% by weight based on the weight of the sulfonated product, to form an acidic neutralized product having a pH of 2.5 through 4 and; then,

(b) adding an aqueous caustic alkali solution having a concentration of 1 through 5% by weight to the acidic neutralized product to adjust the pH of the acidic neutralized product to 6 through 7.

4,404,144

UNSATURATED ANALOGS OF β-ALKYL-β-HYDROXY GLUTARIC ACID AND ESTERS THEREOF

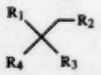
Chi-Dean Liang, Glenview, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 236,092, Feb. 20, 1981, abandoned. This application Dec. 7, 1981, Ser. No. 327,821

Int. Cl.[3] **C07C** *69/675, 69/732, 59/185, 59/245, 59/58, 59/76, 49/175, 49/255*

U.S. Cl. 260—410.9 R **15 Claims**

1. A compound of the formula



wherein R_1 is C_9 to C_{19} alkenyl or alkadienyl; R_2 is dialkoxymethyl or carboxy; R_3 is hydroxy or alkoxy carbonylmethyl when R_4 is hydroxy, or R_3 and R_4 are taken together to form a carbonyl oxygen; and pharmaceutically acceptable salts thereof.

4,404,145

PROCESS FOR SEPARATING FATTY ACIDS FROM ROSIN ACIDS

Michael T. Cleary, Elmhurst; Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 333,250, Dec. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 297,453, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 252,745, Apr. 10, 1981, Pat. No. 4,329,280. This application Aug. 12, 1982, Ser. No. 407,672

Int. Cl.[3] **C11C** *1/08*

U.S. Cl. 260—419 **17 Claims**

1. A process for separating a fatty acid from a feed mixture comprising a fatty acid and a rosin acid, said process comprising contacting said feed mixture at separation conditions with a molecular sieve comprising silicalite, thereby selectively retaining said fatty acid, removing rosin acid from the fatty acid containing molecular sieve and recovering said fatty acid from the molecular sieve.

4,404,146

METAL OXYALKYLATES AND METHOD OF MAKING SAME

Joseph E. Lionelle, and Jeffrey A. Staffa, both of Salida, Colo., assignors to BioSystems Research Inc., Salida, Colo.

Continuation-in-part of Ser. No. 217,119, Dec. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 194,849, Oct. 7, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 304,305

Int. Cl.[3] **C07F** *3/06*

U.S. Cl. 260—429.9 **20 Claims**

1. A method of preparing a metal oxyalkylate which comprises reacting, in an aqueous reaction mixture at a temperature of below about 130° C., a metal, a carboxylic acid, and hydrogen peroxide to form said metal oxyalkylate, said hydrogen peroxide being utilized in said reaction mixture as a dilute aqueous solution of up to 10% H_2O_2, precipitating said metal oxyalkylate, and separating the precipitated metal oxyalkylate.

4,404,147

PROCESS FOR THE SYNTHESIS OF 1,1-DIPHOSPHAFERROCENES

Guillaume de Lauzon, and Francois Mathey, both of Paris, France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

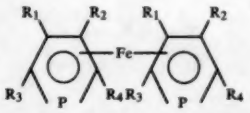
Filed Dec. 2, 1981, Ser. No. 326,615

Claims priority, application France, Dec. 10, 1980, 80 26168

Int. Cl.[3] **C07F** *17/02*

U.S. Cl. 260—439 CY **9 Claims**

1. Process for the synthesis of 1,1'-diphosphaferrocenes of the general formula:



in which R_1, R_2, R_3 and R_4 are C_1 to C_6 alkyl, C_6 to C_{12} aryl, C_7 to C_{12} alkaryl, C_7 to C_{12} aralkyl or a hydrogen atom, R_1, R_2, R_3 and R_4 being the same or different, by reacting anhydrous ferrous chloride with a mixture of equimolar amounts of a substituted alkali metal phospholyl and an alkali metal phenyl, wherein before reacting the ferrous chloride with the mixture,

the latter is treated with a Lewis acid at a te.:perature between −80° C. and +50° C.

4,404,148

METHOD FOR THE PREPARATION OF DIFLUOROMETHOXYAROMATIC COMPOUNDS

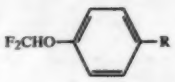
Jack K. Siddens, Princeton Junction, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 420,164

Int. Cl.³ C07C *121/75, 43/225, 69/712, 79/35*

U.S. Cl. 260—465 F **9 Claims**

1. A method for the preparation of a compound of structural formula-(I)

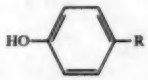


(I)

wherein R is C_1–C_3 alkyl, halogen, nitro, or the moiety

wherein R_1 is CN, $COOR_2$, OH or OR_3; R_2 is C_1–C_3 alkyl; R_3 is tosyl, mesyl or C_2–C_4 alkanoyl; comprising:

reacting one molar equivalent of a compound of structural formula-(II)



(II)

wherein R is as hereinabove defined, with two to three molar equivalents of chlorodifluoromethane added under a pressure of from about 0.4 to 2.5 kg cm^{-2} over a period of time from about 30 minutes to 1.0 hour at a temperature from about 20° to 40° C., and further maintained at the above pressure and temperature ranges for about 0.1 to 6 hours, or until said reaction is essentially complete, in the presence of from about 1740 to 2614 mol percent of added water, acetone used at a rate of 4 ml per gram of the compound of formula-(II), 10 mol percent of benzyltriethylammonium chloride, and simultaneously

adding to the pressurized reaction mixture an aqueous solution of four molar equivalents of an alkali metal hydroxide of sodium or potassium hydroxide over about a 1 to 4 hour period, wherein the concentration of said aqueous solution is such that on completion of the reaction the total amount of water added to the reaction mixture is from about 2614 to 3482 mol percent.

4,404,149

PROCESS FOR PREPARING 2,2-DICHLOROACETOACETYL CHLORIDE

Jean-Claude Perlberger, Miege, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

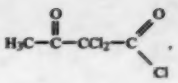
Division of Ser. No. 321,053, Nov. 13, 1981. This application Jun. 1, 1982, Ser. No. 383,935

Claims priority, application Switzerland, Nov. 19, 1980, 8549/80

Int. Cl.³ C07C *51/62*

U.S. Cl. 260—544 Y **6 Claims**

1. Process for producing 2,2-dichloroacetoacetyl chloride having the formula:



characterized in that acetyl chloride is reacted by means of a Lewis acid as a catalyst with chlorine at a temperature of 30° to 60° C., the mole ratio of acetyl chloride to the catalyst being from 1:0.005 to 1:0.5 and the mole ratio of acetyl chloride to the chlorine being from 1:0.1 to 1:1.5, whereby the 2,2-dichloroacetoacetyl chloride results.

4,404,150

CYCLIC PYROPHOSPHATE DERIVATIVES AND THEIR PREPARATION

Mitsuyoshi Tsunekawa, Toyonaka; Nobuyoshi Miyoshi, Ibaraki, and Tamotsu Komura, Nara, all of Japan, assignors to Sankin Industry Co., Ltd., Osaka, Japan

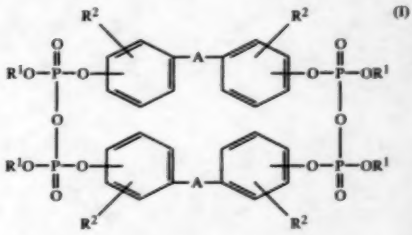
Filed Feb. 5, 1981, Ser. No. 231,914

Claims priority, application Japan, Aug. 20, 1980, 55-114995

Int. Cl.³ C07F *9/15*

U.S. Cl. 260—927 R **17 Claims**

1. A cyclic pyrophosphate derivative having the formula (I):



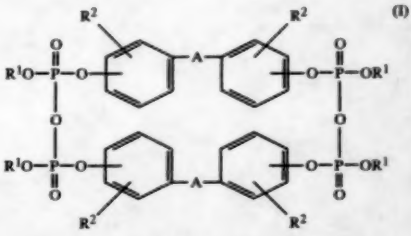
(I)

wherein A represents a direct bond between the two phenyl rings or a divalent moiety selected from the group consisting of lower alkylene, aryl substituted lower alkylene, cycloalkylidene, sulfonyl and oxy;

R^1 represents allyl, acryloyloxy lower alkyl or methacryloxy lower alkyl, in which the lower alkyl can be substituted with halogen; and

R^2 represents independently hydrogen, halogen, lower alkyl or lower alkoxy.

16. A process for the production of cyclic pyrophosphate derivatives having the formula (I)



(I)

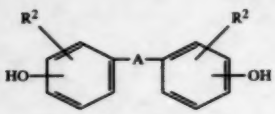
wherein A represents a direct bond between the two phenyl rings or a divalent moiety selected from the group consisting of lower alkylene, aryl substituted lower alkylene, cycloalkylidene, sulfonyl and oxy;

R^1 represents allyl, acryloyloxy lower alkyl or methacryloyloxy lower alkyl, in which the lower alkyl can be substituted with halogen; and

R^2 represents independently hydrogen, halogen, lower alkyl or lower alkoxy;

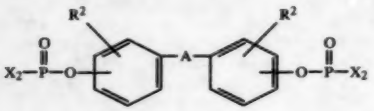
the process comprising:

reacting, under anhydrous conditions, a phenol derivative having the formula (II)



(II)

with a phosphoryl halide to give the phosphoryl dihalide derivative having the formula (III)



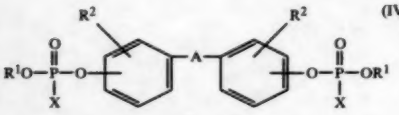
(III)

wherein X is halogen;

adding to the phosphoryl dihalide derivative having the formula (III), under anhydrous conditions, an alcohol having the formula

R^1—OH

to obtain a phosphoryl halide derivative having the formula (IV)



(IV)

which is then hydrolyzed, in the presence of a base, to provide the cyclic pyrophosphate derivative having the formula (I).

4,404,151

DOWN-DRAFT CARBURETOR

Terence Inkpen, Chelmsford, and Frank T. Newbury, Great Dunmow, both of England, assignors to Ford Motor Company, Dearborn, Mich.

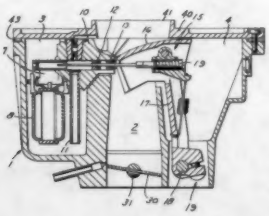
PCT No. PCT/US79/00613, § 371 Date Apr. 18, 1980, § 102(e) Date Apr. 18, 1980, PCT Pub. No. WO80/00470, PCT Pub. Date Mar. 20, 1980

PCT Filed Aug. 15, 1979, Ser. No. 270,532

Claims priority, application United Kingdom, Aug. 19, 1978, 33965/78

Int. Cl.³ F02M 9/06

U.S. Cl. 261—44 C **1 Claim**



1. A downdraft carburetor consisting of a one-piece unitary casting supporting the working components of the carburetor, and a non-supporting cover with an opening defining the upper end of an air induction passage, the casting having cavities and walls defining a centrally located induction passage aligned with the opening in the cover, a first cavity defining a float bowl to one side of the induction passage, an opening in the wall of the induction passage connecting the float bowl and induction passage for the passage of fuel therebetween, a one-piece fuel assembly jet block mounted in the opening consisting of a fuel supply inlet, a float, a fuel induction tube, a fuel passage, and a pair of fuel jet orifices in the fuel passage adapted to receive a fuel metering needle slidably therein, a second cavity on the opposite side of the induction passage and containing a movable wall, the induction passage containing a throttle valve at one end and a venturi-like portion adjacent the other end defined in part by the movable wall to together define a variable area venturi, the movable wall having secured thereto a fuel metering needle having an end movable and receivable within the orifices in the fuel passage to be capable of varying fuel flow upon movement of the movable wall to vary the venturi size, means connecting the movable wall cavity to the induction passage at a point between the throttle valve and venturi so as to subject the second cavity to the level of pressure in the induction passage, and a vacuum servomotor connected to the movable wall and mounted on the casting and communicating with the second cavity for moving the movable wall in response to changes in level of the pressure in the second cavity to vary the venturi size and fuel flow.

4,404,152

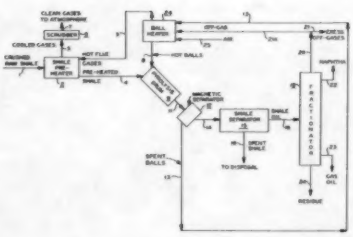
IRON-CONTAINING REFRACTORY BALLS FOR RETORTING OIL SHALE

Lyle W. Pollock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 209,926, Nov. 24, 1980, Pat. No. 4,371,481, which is a division of Ser. No. 9,627, Feb. 6, 1979, Pat. No. 4,360,565, which is a division of Ser. No. 837,130, Sep. 28, 1977, Pat. No. 4,160,719. This application Sep. 30, 1982, Ser. No. 431,484

Int. Cl.³ B01J 2/00

U.S. Cl. 264—15 **8 Claims**



1. A process for preparing iron-containing ceramic balls, containing about 10 to 90 weight percent iron and the balance a high refractory alumina, which comprises:

(a) leaching particles of spent aluminum-containing shale from a shale oil-retorting process with dilute alkali,

(b) washing the leached particles, to form an alumina-containing liquor and solid particles,

(c) separating the liquor,

(d) precipitating alumina from said liquor with alkali as a floc,

(e) admixing said alumina floc and sufficient water to form an extrudable wet admixture,

(f) extruding said wet extrudable admixture to provide wet cylinders of about $\frac{1}{4}\times\frac{1}{4}$ inch to $\frac{1}{2}\times\frac{1}{2}$ inch,

(g) tumbling said wet cylinders sufficiently to reshape said cylinders to ball-shape, thereby providing first size wet alumina balls of about $\frac{1}{4}$ inch to $\frac{1}{2}$ inch in diameter,

(h) contacting said first size wet alumina balls with iron particles thereby substantially coating said first size wet alumina balls with iron particles,

(i) admixing said iron particle coated first size alumina balls with further water and alumina thereby over-coating further alumina over said iron particles and forming second size alumina over-coated iron particle-coated alumina balls,

(j) heating the resulting second-size over-coated balls to a temperature of about 2800° F. to 3400° F. for a time sufficient to convert said second-size balls to iron-containing ceramic balls, and

(k) cooling said fired ceramic balls in the substantial absence of molecular oxygen,

wherein said iron-containing ceramic balls contain an inner alumina-core, a shell of iron-particles around said core, and an outer coating of ceramic alumina.

4,404,153

PROCESS FOR THE PREPARATION OF POLY(DISILYL)SILAZANE POLYMERS AND THE POLYMERS THEREFROM

John H. Gaul, Jr., Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 225,274, Jan. 15, 1981, Pat. No. 4,340,619. This application Aug. 10, 1981, Ser. No. 291,539

The portion of the term of this patent subsequent to Jul. 20, 1989, has been disclaimed.

Int. Cl.³ D01C *5/00*

U.S. Cl. 264—29.2 **4 Claims**

4. A silicon carbide containing ceramic article prepared by a method which consists of

(A) adding and mixing a conventional ceramic filler with an R'_3SiNH—containing silazane polymer;

(B) forming an article of the desired shape from the filled R'_3SiNH—containing silazane polymer;

(C) heating the article formed in (B) in an inert atmosphere or in a vacuum to an elevated temperature of at least 750° C. until the silazane polymer is converted to silicon carbide containing ceramic, which silazane polymer is obtained by a process which consists of contacting and reacting in an inert, essentially anhydrous, atmosphere, a chlorine-containing disilane or a mixture of chlorine-containing disilanes, wherein the number of diorgano-substituted silicon atoms does not exceed the number of monorgano-substituted silicon atoms, of the general formula

$$(Cl_aR_bSi)_2$$

with a disilazane having the general formula

$$(R'_3Si)_2NH$$

at a temperature in the range of 125° C. to 300° C. while distilling by-produced volatile products, wherein

R is vinyl, an alkyl group of 1–3 carbon atoms or the phenyl group;

R' is vinyl, hydrogen, an alkyl group of 1–3 carbon atoms or the phenyl group;

a has a value of 0.5–3;

b has a value of 0–2.5 and the sum of a+b is equal to three.

4,404,154

METHOD FOR PREPARING CORROSION-RESISTANT CERAMIC SHAPES

Richard M. Arons, Wheaton, and Joseph T. Dusek, Downers Grove, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Continuation of Ser. No. 101,363, Dec. 7, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,088

Int. Cl.³ C04B *33/24*

U.S. Cl. 264—62 **6 Claims**

1. A method of preparing a refractory ceramic shape having an impermeable and corrosion-resistant metallic tungsten coating comprising:

preparing a ceramic casting slip consisting of a finely divided ceramic powder, 0.5 to 5.0 weight percent yttria powder and a suspending agent in a water vehicle, the particle size of the ceramic powder being such that a shape formed from the slip will fire to a density of at least 90% of theoretical and the shape will have a predetermined shrinkage rate during firing,

forming a green ceramic shape from the slip,

drying the green shape until it contains about 5 to 12 weight percent moisture,

preparing a coating slip consisting of finely divided tungsten powder and about 0.5 to 1.0 weight percent ammonium alginate as a suspending agent in a water vehicle, the particle size of the tungsten powder being such that the tungsten slip will fire to a density of at least 80% of theoretical and will have a shrinkage rate during firing which is about the same as the shrinkage rate of the ceramic slip,

applying a coating of the tungsten slip to the surface of the damp green ceramic shape to form a green composite shape, and

firing the green composite shape in a vacuum or reducing atmosphere at a temperature and for a period of time sufficient to sinter and densify the green ceramic and the tungsten coating, thereby forming a dense ceramic shape having an impermeable and corrosion-resistant metallic tungsten coating.

4,404,155

METHOD OF FORMING GAS CHROMATOGRAPHIC SUPPORTS

Christian J. Miga, Littleton, Colo., and Millard Mills, Santa Barbara, Calif., assignors to Manville Service Corporation, Denver, Colo.

Filed Feb. 3, 1982, Ser. No. 345,274

Int. Cl.³ C04B *35/64*

U.S. Cl. 264—67 **9 Claims**

1. A method of forming gas chromatographic supports comprising:

(a) blending together bentonite clay and diatomaceous earth wherein said bentonite clay is present in amounts between 0.5% to 3.0% by weight and said diatomaceous earth is present in amounts between 97% to 99.5% by weight;

(b) forming a water solution containing between 1% to 9% of a flux material;

(c) spraying said water solution onto said blended bentonite clay and diatomaceous earth in amounts between 36% and 50% by weight of said blended bentonite clay and diatomaceous earth and mixing to form a composition;

(d) forming said composition into a plurality of separate masses;

(e) drying said masses and crushing them to a predetermined mesh size;

(f) calcining said crushed masses for a period of time from about 20 to 45 minutes at temperatures of from about 1800° to 2100° F.; and

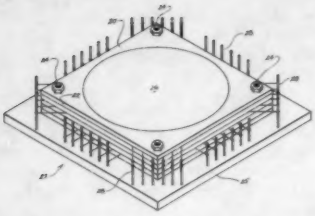
(g) crushing said calcined crushed masses and separating into various mesh sizes from about 30 to 140 mesh.

4,404,156

METHOD FOR MAKING CONTINUOUS FIBER REINFORCED CAST THERMOPLASTIC STRUCTURES

Ronald K. Ogletree, 392 Fairlane Dr., Spartanburg, S.C. 29302

Filed Aug. 3, 1981, Ser. No. 289,117
Int. Cl.[3] B29C *6/00*; B29D *3/02*
U.S. Cl. 264—162 12 Claims



1. A method for making a reinforced cast thermoplastic structure comprising: in a mold having a base member and a cavity of a desired shape, plural pins being disposed about said mold and projecting from said base member and perpendicular thereto;

selectively arranging continuous fiber reinforcing elements extending across said cavity to form a plurality of spaced fiber layers, securing said elements to said pins at a plurality of elevations corresponding to said spaced fiber layers;

adding a thermoplastic polymeric material to said mold in fluid form; and solidifying said material in said shape generally without deformation or change in arrangement of said reinforcing fibers in said mold cavity.

4,404,157

PROCESS FOR THE CONTINUOUS PRODUCTION OF VISCOSE RAYON YARNS HAVING HIGH DEGREE OF WHITENESS

Gianfranco Angelini, Buscate; Novello Leoncini, Limbiate; Bice Pallesi, Milan, and Ugo Paoletti, Monza, all of Italy, assignors to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Filed Jun. 17, 1981, Ser. No. 274,369
Int. Cl.[3] D01F *11/02*
U.S. Cl. 264—195 9 Claims

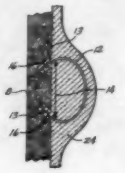
1. In a process for the continuous production of viscose rayon yarns, which comprises extruding a viscose solution into a coagulating bath, drawing and coagulating the resultant extruded filaments in said bath, and advancing said filaments in a substantially helical path while said filaments undergo treatments required for the production of a finished yarn, the improvement wherein, after said filaments are withdrawn from said coagulating bath, said filaments are further coagulated until a coagulation index not higher than 1 is attained, and said filaments having a coagulation index not higher than 1 are treated with water having a pH between 4.0 and 5.5, a Ca^{2+} content not higher than 1.5 mg/l, and a Mg^{2+} content not higher than 1.0 mg/l, until the content of the following elements in the yarn has been reduced to values not higher than indicated: total sulphur 0.2%, sulphur bound as sulphides 0.02%, elemental sulphur 0.06%, iron 40 ppm, zinc 700 ppm, and lead 30 ppm.

4,404,158

METHOD OF MAKING A BUILDING PANEL

Ralph C. Robinson, Redmond, Wash., assignor to Olympian Stone Company, Redmond, Wash.

Division of Ser. No. 884,437, Mar. 8, 1978, Pat. No. 4,223,502.
This application Nov. 26, 1979, Ser. No. 97,197
Int. Cl.[3] B28B *21/44, 21/70*; B29D *3/00*
U.S. Cl. 264—263 6 Claims



1. A method of forming a building panel from a plurality of relatively thin, pre-sized panels of a selected facing material such as granite or marble, comprising the steps of:

(a) placing the panels of the selected facing material face down into a supporting form;

(b) placing sealing means between adjacent edges of said panels and said form;

(c) securing anchors to the back surface of each panel of said facing material;

(d) applying connectional bond breaker to the back surface of each panel;

(e) forming a slurry of concrete and chopped glass fiber strands;

(f) spraying the slurry directly on the back surface of said panels of facing material to cover said panels and said anchors to form an integral, panel supporting frame; and,

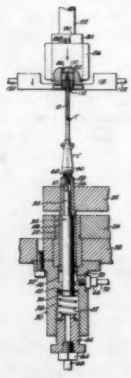
(g) curing said slurry and removing the completed building panel from said supporting form.

4,404,159

APPARATUS AND PROCESS FOR FORMING A TAPERED TIP END ON A PLASTIC TUBE

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Mar. 16, 1981, Ser. No. 243,899
Int. Cl.[3] B29C *24/00*
U.S. Cl. 264—296 26 Claims



1. An apparatus for forming an open ended feathered tapered tip on a thin-walled plastic tube, said apparatus comprising:

a die assembly structured and configured to receive and shape the tip of said plastic tube, a mandrel fixedly at-

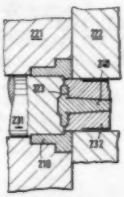
tached in supported relation to a movably mounted piston means, a support means structured for fixed positioning of said tube relative to said movable die assembly and movable mandrel, said mandrel disposed in aligned relation to said die assembly and structured to at least partially support said plastic tube thereon in slidable relation thereto; said die assembly comprising a heated die portion and a cooled die portion; activating means connecting to both said heated and cooled die portions and structured to dispose said die portions into and out of operative forming relation to said tube tip and in surrounding relation to said mandrel; said heated die portion including a cavity comprising a lower portion and an upper portion disposed in contiguous relation to one another, said upper portion having a tapered configuration and resultant decreasing diameter from its junction with said lower portion to a terminal end of said cavity, said terminal end defining a seat for engagement with the distal end of said mandrel protruding from said tube tip being formed, said mandrel and supporting piston movable relative to the substantially fixed position of said tube along with said die assembly, said tube tip being heated and forced into said upper portion of said cavity, whereby said tube tip is formed into an open ended feathered tapered configuration in conformance with the configuration of said cavity.

4,404,160

METHOD AND DEVICE FOR ELIMINATING THE FEEDER HEAD PORTION INJECTION MOULDING PROCESS

Giancarlo Bonissone, and Piero Mulas, both of Genoa, Italy, assignors to F.I.P. Formatura Iniezione Polimeri S.p.A., Genoa, Italy

Filed Mar. 27, 1981, Ser. No. 248,224
Claims priority, application Italy, Apr. 15, 1980, 12509 A/80
Int. Cl.³ B29F *1/05*
U.S. Cl. 264—328.9 4 Claims



1. A method for eliminating a circumferentially continuous feeder head portion which results at the end of the injection moulding of a tubular article of thermoplastic material, comprising filling a mould for forming the tubular article, and moving a movable obturator into a terminal portion of a thermoplastic material feed duct of the mould so as to block the feed duct, and further moving said obturator to compress the plastic material in the mould while maintaining the end of said obturator tangential to the surface of the tubular article which has just been formed.

2. A device for eliminating a circumferentially continuous feeder head portion at the end of the injection moulding of a tubular article of thermoplastic material, comprising: a mould body having a tubular cavity for forming a tubular article and a circumferentially continuous feed duct for injecting material into the tubular cavity; and at least one annular obturator movable between a rest position in which it leaves open the circumferentially continuous feed duct for the material being injected, and a working position in which it intercepts said feed duct and compresses the material injected into the tubular cavity; wherein said obturator is tangential to the cylindrical surface of the tubular article which is formed in the tubular cavity when said obturator is in the working position.

4,404,161

PROCESS FOR INJECTION MOLDING A RAPIDLY CRYSTALLIZING POLYETHYLENE TEREPHTHALATE COMPOSITION AT REDUCED MOLD TEMPERATURES

Peter Bier, New Martinsville, W. Va., assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 95,274, Nov. 19, 1979, abandoned. This application Apr. 15, 1981, Ser. No. 254,351
Int. Cl.³ B29F *1/08*
U.S. Cl. 264—328.16 6 Claims

1. A process for injection molding a thermoplastic composition comprising:

(a) intimately blending (i) a polyethylene terephthalate having an intrinsic viscosity of at least 0.3 dl/g measured as a 0.5% by weight solution in a 1:1 mixture of phenol and tetrachloroethane at 25° C.; and (ii) a multi-phase composite interpolymer comprising:

(A) about 25 to 95 weight percent of a first elastomeric phase polymerized from a monomer system comprising about 75 to 99.8% by weight C_1 to C_6 alkyl acrylate, 0.1 to 5% by weight crosslinking monomer, 0.1 to 5% by weight graftlinking monomer, said crosslinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups all of which polymerize at substantially the same rate of reaction, and said graftlinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups, at least one of which polymerizes at a substantially different rate of polymerization from at least one other of said reactive groups; and

(B) about 75 to 5 weight percent of a final, rigid thermoplastic phase which is polymerized in the presence of said elastomeric phase and which is free of epoxy groups; and

(b) injection molding said blend into a mold held at a temperature of no more than 120° C. and no less than 80° C.,

said molding temperature and the amount of interpolymer being selected to yield articles with crystallinities similar to those obtainable when the same article is molded from the same composition without the interpolymer at mold temperatures of 140° C.

5. A composition particularly suitable for injection molding into molds held at temperatures less than 120° C. comprising

(a) 35 to 75 wt % of a polyethylene terephthalate having an intrinsic viscosity of at least 0.3 dl/g measured as a 0.5% by weight solution in a 1:1 mixture of phenol and tetrachloroethane at 25° C.;

(b) 5 to 20 wt % of a multiphase composite interpolymer comprising:

(A) about 25 to 95 weight percent of a first elastomeric phase polymerized from a monomer system comprising about 75 to 99.8% by weight C_1 to C_6 alkyl acrylate, 0.1 to 5% by weight crosslinking monomer, 0.1 to 5% by weight graftlinking monomer, said crosslinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups all of which polymerize at substantially the same rate of reaction, and said graftlinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups, at least one of which polymerizes at a substantially different rate of polymerization from at least one other of said reactive groups; and

(B) about 75 to 5 weight percent of a final, rigid thermoplastic phase which is polymerized in the presence of said elastomeric phase and which is free of epoxy groups; and

(c) 20 to 45 wt % of glass fibers.

4,404,162

PROCESS FOR PRODUCING A THIN-WALL DEEP DRAWN CONTAINER OF THERMOPLASTIC RESIN

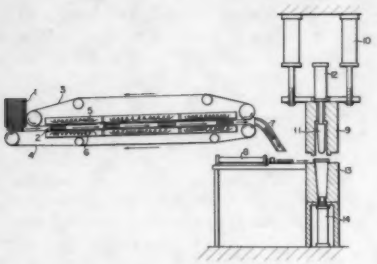
Kyosuke Miki, Yokohama; Masahiro Takeuchi, Yamato, and Toshio Suzuki, Yokohama, all of Japan, assignors to Sumitomo Bakelite Company Ltd., Japan

Filed Jul. 11, 1980, Ser. No. 167,588

Claims priority, application Japan, Jul. 16, 1979, 54-89231; Feb. 27, 1980, 55-22655

Int. Cl.[3] B29C *17/04*; B29D *9/04*

U.S. Cl. 264—514 2 Claims



1. A process for producing a thin-wall, deep-drawn container from a thermoplastic resin sheet by plug assist pressure-forming in a cavity of a female mold, comprising

precutting a mono-layer or multi-layer sheet having a thickness of 1.2 mm or more composed mainly of a crystalline polypropylene, extruded through a T-die by a melt-extrusion method to a tetragonal shape, having an area slightly larger than the area of the periphery of a ring-shaped flange part of the container to be formed,

feeding the thus precut tetragonal sheet between a pair of conveyor belts, and passing the resulting assembly between hot press plates by rotating the conveyor belts therebetween, thereby passing the assembly between the hot press plates while pressing the assembly so that the entire surfaces of both upside and downside of the sheet are uniformly contacted with the surfaces of the hot press plates through the conveyor belts to preheat uniformly the sheet to a moldable temperature within the range from the crystal melting point of the crystalline polypropylene (Tm) to (Tm-50)°C.,

moving the preheated sheet to a position over an aperture end of the cavity of the female mold,

subsequently applying a pressing pressure of 100 kg/cm^2 or more to the preheated sheet from the upside and the downside by means of a pair of ring-shaped forging means, the inner shape and size of the forging means being the same as those of the aperture end of the cavity of the female mold, whereby the somewhat inside of the peripheral part of the sheet is forged and cooled to form the ring-shaped flange part inside the peripheral part of the tetragonal precut sheet,

drawing the sheet, while firmly fixing said flange part of the sheet with said pair of forging means, into the cavity of the female mold to a depth of at least 80% of the depth of the cavity by means of a tapered metal plug maintained at a temperature of (Ts+10)°C. to (Ts−40)°C., wherein Ts is the temperature of the preheated sheet, which plug is composed of a front part and a rear part, and in which plug in all the plug cross-sections including a central axis along the movement direction of the plug and parallel to the central axis of the plug, the front part is substantially semi-elliptical; the central axis of the plug is on the short axis of the ellipse; the boundary line between the front part and the rear part nearly corresponds to the long axis of the ellipse; when the length of the long axis is expressed by a and the length of the short axis is expressed by b, the shape of the contour line of the front part of plug is in the range of $5 \geqq a/b \geqq 1$; the contour line of the front part and the contour line of the rear part are smoothly connected with each other; the contour line starting from the boundary line between the front part and the rear part and approaching the rear end involves a substantially linear part; the shape of contour of the cross-section perpendicular to the central axis of the plug coincides with the shape of contour of the aperture end of the female mold; and the size of the above cross-section contour of the plug is smaller than the aperture end of the female mold over the whole circumference by a degree substantially corresponding to the thickness of said sheet, at the same height as the aperture end of the female mold, so that at the final plug insertion position in the female mold the preheated sheet drawn into the cavity of the female mold can contact with the entire surface of the plug, and which plug decreases in diameter gradually from the rear part end to the front part, and in which plug the ratio between the length from the height of aperture end of the female mold to the front part of the plug on the central axis of the plug and the depth from the aperture end of the female mold to the bottom of the female mold is in the range of 0.85 to 0.98 at the final plug insertion position in the female mold, and the ratio between the outer diameter of the plug and the inner diameter of the female mold is 0.7 to 0.95 at the height of the boundary line between the front part of plug and the rear part of plug; thereby preliminarily stretching the part of the original sheet inside the flange part,

and then introducing a pressure fluid from the plug side onto the sheet, to stretch the part of the sheet inside the flange part by the pressure difference until the area stretch ratio reaches 9 or more based on the original sheet, whereby the sheet is formed on the surface of the cavity of the female mold so as to give a molding dapth vs. caliber ratio of at least 2.0.

4,404,163

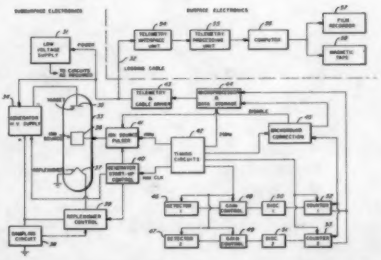
NEUTRON GENERATOR TUBE ION SOURCE CONTROL SYSTEM

James R. Bridges, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 3, 1980, Ser. No. 212,915

Int. Cl.[3] G21G *4/02*

U.S. Cl. 376—119 5 Claims



1. A system for controlling the output of a neutron generator tube of the deuterium-tritium accelerator type and having a replenisher and an ion source to produce sharply timewise defined pulsed of neutrons for well logging use, comprising:

means for inputting a relatively low voltage input control pulse to said ion source said control pulse having approximately a square wave waveform;

means for amplifying said input control pulse to provide an amplified switching pulse;

first electronic switching means, responsive to said amplified switching pulse, for controlling a voltage source applied to a primary winding of a relatively high voltage pulse

transformer having a secondary winding operably connected to said ion source;

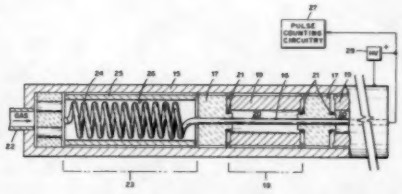
delay means responsive to said input control pulse for producing a time delayed secondary control pulse in response thereto; and second electronic switching means operably connected to said ion source and responsive to said time delayed control pulse for controlling an electronic quenching means operably connected to said secondary winding of said pulse transformer, whereby said first and second electronic switching means operate in timed relationship with each other to produce a rapidly rising relatively high voltage pulse in said secondary winding of said pulse transformer which is applied to said ion source and which is rapidly quenched in a timed relationship by said quenching means.

4,404,164

NEUTRON FLUX PROFILE MONITOR FOR USE IN A FISSION REACTOR

Manfred K. Kopp, Oak Ridge, and Kenneth H. Valentine, Lenoir City, both of Tenn., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 15, 1981, Ser. No. 302,338
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—154 **7 Claims**



1. A neutron flux profile monitor for use in a fission reactor core comprising:

a tubular housing;

a plurality of spaced apart fission counters disposed within and equally spaced along the axis of said housing formed about a common anode disposed along the axis of said housing;

a dielectric material disposed between each of said plurality of counters and about said common anode conductor thereby forming in combination with said anode a delay line;

a high voltage source connected to one end of said anode;

an LC terminating means for terminating the opposite end of said anode so that a first component of the current pulse induced in said anode from a fission event in one of said counters and propagating toward said opposite end thereof is reflected back along said anode to arrive at said one end of said anode at a time differing from the arrival of a second component of said current pulse propagating toward said one end of said anode; and

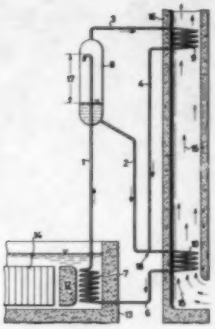
means for detecting the time difference of arrival of said first and second current pulse components at said one end of said anode as an indication of the counter location of said fission event along said anode.

4,404,165

PROCESS FOR CARRYING AWAY THE DECAY HEAT OF RADIOACTIVE SUBSTANCES

Hans Hesky, Runkel, and Armin Wunderer, Hofheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,806
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014289
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—272 **15 Claims**



1. Process for carrying away decay heat of a radioactive substance contained in a storage container by means of a circulating liquid in a closed loop comprising

absorbing said decay heat by heat exchanger means in thermal communication with said radioactive substance;

vaporizing a portion of said liquid into a vapor;

receiving said liquid and said vapor and separating the same into respective phases in separator means including a chamber in which the separated liquid reposes at a liquid level, said liquid and vapor entering the chamber through an adjustable vertical riser conduit coupled with said heat exchanger means and extending an adjustable distance within said chamber for an adjustable height difference above said liquid level, the heat exchanger and riser conduit acting in concert to drive the circulation of said liquid and vapor by percolator pump action, with the height difference corresponding to the pressure drop in the closed loop;

receiving in condenser means the separated vapor from said separator means;

condensing said vapor to liquid phas by removal of heat therefrom;

combining in return conduit means the separated liquid from said separator means and the condensation liquid from said condenser means; and

returning the combined liquid to said heat exchanger means.

4,404,166

METHOD FOR REMOVING BINDER FROM A GREEN BODY

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Witec Cayman Patents, Limited, Cayman Islands, Cayman Islands

Filed Jan. 22, 1981, Ser. No. 227,271
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—36 **16 Claims**

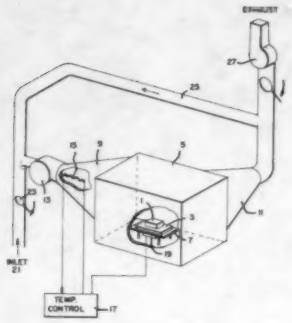
1. A method of producing an article from a fired particulate configuration whereby binder material is removed from the particulate configuration prior to firing without swelling the particulate configuration and consequent imparting of sheer or tensile force to the particulate configuration prior to the firing thereof, comprising the steps of:

(1) mixing together predetermined amounts of sinterable

particulate material and binder whereby the binder covers substantially all of the surface of the particles of said particulate material,

(2) forming said mixture from (1) into a desired configuration,

(3) heating said configuration to a temperature above the flow point of said binder,



(4) blowing a non-saturated, chemically inert atmosphere over said configuration at sufficient flow rate to cause atmosphere at the surface of said configuration to be turbulent and unsaturated to remove a predetermined amount of binder therefrom,

(5) removing said atmosphere in (4) from the vicinity of said configuration, and

(6) sintering said stripped and formed configuration from (4).

4,404,167

PROTECTING STEEL AND FERROUS METALS AGAINST H_2S CORROSION

Iosif L. Rozenfeld, ulitsa Gubkina, 4, kv. 96; Vera M. Brusnikina, Teply Stan, Mikroraion 9B, korpus 7, kv. 262; Larisa V. Frolova, Perekopskaya ulitsa, 18, kv. 80; Alevtina A. Lyashenko, Shelepikhinskoe shosse, 17, korpus 1, kv. 86; Jury V. Sokolov, ulitsa Shabolovka, 21, korpus 3, kv. 117; Böris V. Bocharov, Teply Stan, 9B, korpus D, kv. 148; Alexandr V. Fokin, Bolshoi Rzhevsky pereulok, 11, kv. 14; Nikolai E. Legezin, 9 Parkovaya ulitsa, 6, korpus 1, kv. 85, all of Moscow; Ekaterina V. Dergobuzova, ulitsa Sovetskaya, 10, kv. 59, Vidnoe Moskovskoi oblasti; Boris N. Altshuler, Kerchenskaya ulitsa, 24, kv. 119, Moscow; Saida A. Zelenaya, ulitsa Lermontova, 11, kv. 13, and Emma S. Korobova, ulitsa Lenina, 66, kv. 25, both of Volgodonsk Rostovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 38,865, May 14, 1979, abandoned, which is a division of Ser. No. 944,150, Sep. 20, 1978, abandoned.

This application Mar. 23, 1981, Ser. No. 246,270

Int. Cl.³ C23F *11/04, 11/14*

U.S. Cl. 422—12 **5 Claims**

1. A method for protecting steel and other ferrous metals against corrosion in hydrogen sulfide containing media, by contacting said metal with an effective amount of an organic inhibitor also exhibiting antifoam and foam suppressing activity and having the general formula:

$$R''-(N-R-CN)_n$$
$$\quad\quad\quad

(e) suspending the precipitate washed in step (d) in an aqueous phase; and

(f) stabilizing the precipitate suspended in step (e) by adding thereto an acid phosphate to bring the pH to a value of 7.5 to 9.

4,404,170

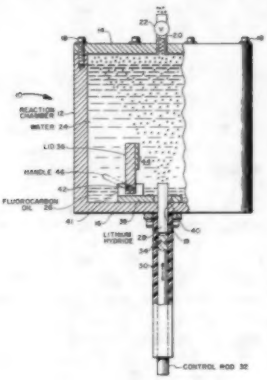
INSTANTANEOUS START AND STOP GAS GENERATOR

Don W. Caudy, Sunbury; Donald J. Hackman, Columbus, both of Ohio; Robert T. Hoffman, Kailua, Hi., and Dale G. Uhler, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1982, Ser. No. 371,142

Int. Cl.³ B01J *7/02*

U.S. Cl. 422—237 **9 Claims**



REACTION MODE

6. A gas generator which can be selectively switched between reaction and nonreaction modes comprising:

a reaction chamber having top and bottom ends with an opening in its bottom end;

said chamber containing reactive and nonreactive liquids, the nonreactive liquid having a greater specific gravity than the reactive liquid;

a solid reactant member;

means for projecting the solid reactant member through the bottom opening of the chamber, through the nonreactive liquid, and into the reactive liquid for generating gas; and

means for withdrawing the solid reactant member from the reactive liquid into the nonreactive liquid for terminating the generation of gas.

4,404,171

TOWER FOR DRYING GASEOUS CHLORINE

Hiroaki Satoh; Yasuyuki Tabata; Kouichi Gomikawa, all of Tokyo, and Masaru Hiruta, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

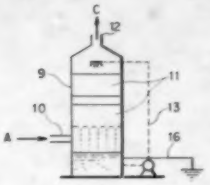
Filed Oct. 16, 1981, Ser. No. 312,150

Claims priority, application Japan, Oct. 28, 1980, 55-151079

Int. Cl.³ B01J *19/02*

U.S. Cl. 422—241 **5 Claims**

1. A tower for drying gaseous chlorine, comprised off a high polymeric composite material wherein said composite material is comprised of 10% to 30% by weight of carbon fibers, 5% to 20% by weight of electroconductive carbon black, and 50% to 85% by weight of a polymeric matrix, wherein said polymeric matrix is comprised of 5% to 25% by weight of modified polypropylene and 75% to 95% by weight of polypropylene;



said tower also having electrical grounding means associated therewith.

4,404,172

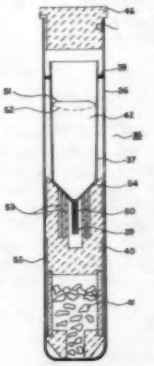
METHOD AND APPARATUS FOR FORMING AND GROWING A SINGLE CRYSTAL OF A SEMICONDUCTOR COMPOUND

William A. Gault, Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,444

Int. Cl.³ C30B *21/02*

U.S. Cl. 422—248 **7 Claims**



1. An apparatus for growing a single crystal of a Group II-VI or III-V semiconductor compound by the gradient zone freeze method including:

(a) an autoclave having contained therein:

(i) a chamber provided with heating means for containing and volatilizing the volatile component of the compound to be grown:

(ii) a growth crucible communicating with the chamber so that an atmosphere of said volatile component is provided in the growth crucible during crystal growth and having a lower seed well region for containing a seed crystal and a transition region and main growth region extending therefrom for containing charge material of the compound; and

(iii) support means for supporting said crucible, said support means having a configuration so as to cause reduction of radial heat flow and an enhancement of axial heat flow at least around the seed well and transition regions of said crucible during crystal growth.

4,404,173

APPARATUS FOR CONTACTING SUBSTANTIALLY IMMISCIBLE LIQUIDS

Ernst C. Bailey, Lakeland; William E. Vickers, Brandon, and Donald B. Stain, Lakeland, all of Fla., assignors to UNC Recovery Corporation, Mulberry, Fla.

Filed Sep. 24, 1980, Ser. No. 190,266

Int. Cl.³ B01D *11/04;* B01F *5/00*

U.S. Cl. 422—257 9 Claims

1. An apparatus for forming a dispersion of a first liquid in a second liquid, said liquids being substantially immiscible, comprising a conduit having an upstream section divided into first and second channels of variable length and a downstream section for mixing said first and second liquids, means for varying the length of said first and second channels, means for varying the width of said first and second channels independently of said means for varying the length, means for flowing said first liquid into said first channel, and means for flowing said second liquid into said second channel whereby said liquids mix in said downstream section of said conduit to form said dispersion of said first liquid in said second liquid.

4,404,174

PURIFICATION OF SOLUTIONS OF GALLIUM VALUES BY SERIAL ION EXCHANGE-LIQUID/LIQUID EXTRACTION

Alain Leveque, Paris, and Michel Triollier, Gouvieux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 30, 1981, Ser. No. 326,166

Claims priority, application France, Dec. 5, 1980, 80 25832

Int. Cl.³ C01G *15/00*

U.S. Cl. 423—112 23 Claims

1. A process for the purification of an aqueous acid solution of gallium values, comprising:

(i) intimately contacting an impure aqueous acid solution of gallium values with a strongly basic ion exchange resin capable of selectively affixing gallium thereto, whereby said gallium values are affixed to said resin, the concentration of chloride ions in said starting aqueous acid solution ranging from about 3.5 to 8 M, and thereafter eluting the gallium from the resin with water to afford a partially purified concentrated solution of gallium chloride;

(ii) adjusting the concentration of the chloride ions in the resulting concentrated aqueous solution to a value ranging from about 4 to 6 M;

(iii) liquid/liquid extracting the adjusted aqueous solution of gallium chloride with an organic phase which comprises an essentially water-insoluble extractant capable of extracting gallium from the aqueous solution, whereby the gallium is transferred into the organic phase, and then separating the organic phase from the aqueous phase;

(iv) selectively washing said organic phase, whereby any remaining impurities are removed;

(v) next transferring the purified gallium from said organic phase into an aqueous solution thereof, and then separating said organic phase from the resulting aqueous phase, whereby said aqueous phase comprises pure gallium chloride.

4,404,175

PREPARATION OF ZEOLITES

Laszlo Marosi, Ludwigshafen; Hans-Ulrich Schlimper, Speyer; Matthias Schwarzmann, Limburgerhof, and Joachim Stabenow, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,379

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1980, 3021580

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 6 Claims

1. A process for obtaining a crystalline ZSM-5 structural type zeolite of the hydrogen cation form directly which comprises reacting at from 100° to 200° C. in an aqueous solution under autogenous pressure in the absence of both alkali metal ions and quaternary nitrogen bases, and in the presence of a triamine, tetraamine and/or higher amine, an aqueous reaction mixture of SiO_2 and $Al(OH)_3$ formulated to have a SiO_2/Al_2O_3 molar ratio

$$96 - \frac{20\,n}{L_R + 4}$$

$$\frac{4\,n}{L_R + 4}$$

which depends on the chain length L_R and number of amine groups n of the amine employed, and an H_2O/amine molar ratio of from 0.4 to 100 and an amine/Al_2O_3 molar ratio of from 5 to 400, and removing the amine from the zeolite pores by combustion.

4,404,176

PREPARATION OF HYDROXYLAMMONIUM SALTS

Otto-Alfred Grosskinsky; Elmar Frommer, both of Ludwigshafen, Fed. Rep. of Germany; Günther Rapp, deceased, late of Ludwigshafen, Fed. Rep. of Germany (by Ruth E. Rapp, legal representative), and Erwin Thomas, Freinsheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,615

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108257

Int. Cl.³ C01B *21/14*

U.S. Cl. 423—387 3 Claims

1. A process for the preparation of hydroxylammonium salts which comprises: catalytically reducing nitric oxide with hydrogen in a dilute aqueous solution of a mineral acid, in the presence of a suspended supported platinum catalyst, at elevated temperatures, wherein the reaction is carried out, in one or more reaction zones, under superatmospheric pressure and wherein the exit gases produced are let down to a lower pressure, and are reacted, in a downstream reaction zone, with the reaction mixture, containing the hydroxylammonium salt, the ammonium salt, the supported platinum catalyst and residual mineral acid, from the upstream reaction zone or zones, or with a fresh aqueous solution of the mineral acid, which contains the supported platinum catalyst in suspension.

4,404,177

METHOD FOR PRODUCING GRAPHITE CRYSTALS

Francis J. Derbyshire, Ewing, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,235

Int. Cl.³ C01B *31/04*

U.S. Cl. 423—448 13 Claims

1. An improved process for continuously or semi-continuously producing highly oriented graphite crystals, said process comprising:

(A) introducing a source of carbon atoms to a first surface of an artifact comprising a Group VIII metal or mixture of Group VIII metals, said first surface being maintained at a temperature of from about 700° C. to 1800° C.,

(B) maintaining a temperature differential of at least 100° C. across said artifact such that carbon atoms diffuse through said artifact to a generally opposite solid second surface of said artifact, said second surface being maintained at a temperature of from about 500° C. to 1250° C.; and

(C) collecting graphite crystals which form on said second surface from carbon atoms which have diffused through said artifact.

4,404,178
APPARATUS AND METHOD FOR PRODUCING CARBON BLACK

Paul H. Johnson, Bartlesville, Okla., and Harweli E. Benjamin, Ang Thong, Thailand, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 930,630, Aug. 3, 1978, abandoned. This application Feb. 15, 1980, Ser. No. 121,764

Int. Cl.³ C01B *31/02;* **C09C** *1/48*

U.S. Cl. 423—450 **34 Claims**

1. In a process for producing carbon black by pyrolysis of a feed hydrocarbon, wherein a gas stream containing carbon black is passed through a means defining a flow path of an indirect heat exchanger on which carbon black deposits are laid down reducing heat transfer efficiency, the improvement comprising cleaning carbon black deposits from said means defining a flow path by:

introducing a mixture containing fluid carrier and additional cleaning carbon black into said means defining a flow path of the heat exchanger, said mixture containing a sufficient amount of additional cleaning carbon black to increase the concentration of carbon black flowing through the means defining a flow path to a concentration effective to remove at least a portion of said carbon black deposits from said means defining a flow path; and by

flowing said mixture along with said gas stream through said means defining a flow path and thereby removing at least a portion of said carbon black deposits from said means defining a flow path.

28. In an apparatus for producing carbon black wherein a gas stream containing carbon black is cooled in means defining a flow path of an indirect heat exchanger on which carbon black deposits are laid down which reduce heat transfer efficiency, the improvement comprising:

means for flowing additional cleaning carbon black into the means defining a flow path to increase the concentration of carbon black flowing therethrough to a concentration effective to remove at least a portion of such carbon black deposits from the heat exchanger.

4,404,179
DESTRUCTION OF HYPOCHLORITE

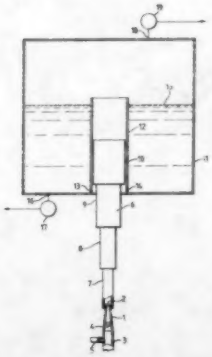
Stephen J. Eastwood, Wigan, and Kelvin S. Timms, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 20, 1981, Ser. No. 284,949

Claims priority, application United Kingdom, Aug. 4, 1980, 8025353

Int. Cl.³ C01B *17/02*

U.S. Cl. 423—500 **16 Claims**



1. A process for the destruction of hypochlorite by reacting the hypochlorite with acid to produce chlorine in an apparatus of the type comprising

(1) a nozzle for converting pressure energy of a liquid into kinetic energy,

(2) at least one desorption tube extending from the nozzle and having a gas-tight connection thereto and having an inlet end of larger cross-sectional area than the outlet of the nozzle, and

(3) a vessel connected to the outlet end of the desorption tube and having a gas-tight connection thereto, the vessel being equipped with means for removing chlorine and liquid therefrom,

the process comprising causing pressured acidified liquid to be charged to the nozzle and to issue therefrom in the form of a jet which diverges downstream of the nozzle and comes into contact with the entire inner periphery of a part of the desorption tube to seal a totally enclosed space between the jet and the desorption tube, mixing hypochlorite solution with the acidified liquid before the liquid issues from the nozzle, and removing from the vessel gaseous chlorine and liquid which have passed to the vessel.

4,404,180
MANUFACTURE OF HYDROGEN SULFIDE

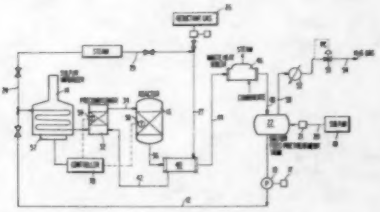
Ian Drum, Calgary, Canada; Richard S. Madenburg, Boise, Id.; Douglas M. Paulsrude, Eugene, Oreg.; Carroll H. Sherman, Monaca, Pa.; Frank G. Turpin, Boise, Id., and Gerry A. Wheatcroft, Calgary, Canada, assignors to Home Oil Company Limited, Calgary, Canada and Morrison-Knudsen Company, Inc., Boise, Id.

Continuation-in-part of Ser. No. 179,528, Aug. 19, 1980, Pat. No. 4,332,774. This application Aug. 13, 1981, Ser. No. 292,360

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ C01B *17/16;* **C22B** *17/00, 21/00;* **C01G** *9/00*

U.S. Cl. 423—563 **8 Claims**



1. Method for operating hydrogen sulfide manufacturing apparatus to eliminate requirements for storage of hydrogen sulfide product gases by providing for production of hydrogen sulfide on demand,

such hydrogen sulfide manufacturing apparatus including

an interconnected system for combining sulfur, sulfur reductant feedstock and steam for reaction to produce hydrogen sulfide,

a source of gaseous sulfur reductant feedstock having a predetermined temperature,

means for introducing gaseous sulfur-reducing feedstock to such system including means for interrupting such introduction of sulfur-reducing feedstock,

vaporizer and superheater means including separately controllable heat source means for vaporizing liquid sulfur and superheating such sulfur vapors,

means for supplying liquid sulfur at a predetermined temperature,

means for delivering such liquid sulfur into the vaporizer and superheater means,

means for quantitatively controlling delivery of liquid sulfur to the vaporizer and superheater means,

means for supplying steam at a predetermined temperature,

means for controlling supply of steam to the hydrogen sulfide manufacturing system including means for introducing steam into the vaporizer and superheater means to be superheated and means for introducing steam through such means for introducing gaseous sulfur-reducing feedstock,

reaction vessel means for reacting sulfur vapors with such sulfur-reducing feedstock and steam to produce product gases including hydrogen sulfide, and

discharge means for the product gases including valve means for interrupting discharge of product gases,

such method comprising the following steps for interrupting the production of hydrogen sulfide resulting from introduction of liquid sulfur, sulfur-reducing feedstock, and steam into such system and for placing the system in standby condition,

interrupting input of such sulfur-reducing feedstock to such system,

controllably continuing introduction of sulfur through such vaporizer and superheater at least until reductant feedstock has been removed from the system,

controlling the separately controllable heat source means for the vaporizer and superheater means to maintain temperatures within such system at a level related to system temperatures maintained during production of hydrogen sulfide, and

controllably continuing introduction of steam to such system with a major portion of the steam being introduced through such vaporizer and superheater means and a minor portion being introduced through such means for introducing sulfur-reducing feedstock to maintain a positive flow of steam to prevent back-flow of other gases being delivered by such vaporizer.

4,404,181

EXTENDED-LIFE TISSUE FIXATIVE COMPOSITION AND METHOD OF USING THE SAME

Thomas Mauthner, Livonia, Mich., assignor to Cambridge Chemical Products, Inc., Ft. Lauderdale, Fla.

Filed Oct. 15, 1981, Ser. No. 311,682

Int. Cl.³ G01N *1/28;* **A01N** *1/02;* **A61K** *35/12;* **C12N** *5/00*

U.S. Cl. 424—3 **14 Claims**

1. An extended-life aqueous tissue histological fixative composition or solution comprising components expressed as approximate percent by weight based on total weight of the solution: glutaraldehyde, 5.5 to 10.0; a boric acid-borate buffer expressed as sodium tetraborate-10H_2O, 0.010 to 0.1, and boric acid, 0.120 to 0.6; a buffer stabilizer comprising one or more water soluble ascorbic acid compounds expressed as ascorbic acid, 0.100 to 0.8; and a metal complexing agent comprising one or more water soluble citric acid compounds expressed as sodium citrate, 0.06 to 1.0; and water to make 100%.

4,404,182

ETHIODIZED OIL EMULSION FOR INTRAVENOUS HEPATOGRAPHY

Michael Vermess, Potomac; Dulal C. Chatterji, Germantown; George J. Grimes, Jr., Laurel, and Joseph F. Galielli, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jan. 8, 1980, Ser. No. 110,293

Int. Cl.³ A61K *49/04*

U.S. Cl. 424—5 **4 Claims**

1. A method of showing opacification in the liver and spleen of animals by injecting intravenously a dosage of emulsified ethiodized oil which contains about 30–35% of oil particles in the size range of 2–3 microns to increase selectively the X-ray attenuation of liver and spleen in experimental animals.

4,404,183

SUSTAINED RELEASE PHARMACEUTICAL COMPOSITION OF SOLID MEDICAL MATERIAL

Hiroitsu Kawata, Kawagoe; Masayoshi Aruga, Ageo; Tadayoshi Ohmura, Niiza; Takashi Sonobe, Saitama; Satoru Yoneya, Omiya, and Chiharu Sone, Matsudo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Division of Ser. No. 165,244, Jul. 2, 1980, Pat. No. 4,343,789. This application Jul. 29, 1982, Ser. No. 403,007

Claims priority, application Japan, Jul. 5, 1979, 54-85209; Mar. 22, 1980, 55-36514

Int. Cl.³ A61K *9/14, 9/26, 9/52, 9/58*

U.S. Cl. 424—19 **9 Claims**

1. A sustained release pharmaceutical composition comprising an effective amount of an amorphous form of indomethacin or a salt thereof, and polyethylene oxide in the form of a fine powder or fine particle granules.

4,404,184

FLAVORING WITH METHYL-THIO-2-METHYL-2-PENTENOATE

Alan O. Pittet, Atlantic Highland; Ranya Muralidhara, Fair Haven, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 318,429, Nov. 5, 1981. This application Jan. 18, 1983, Ser. No. 458,892

Int. Cl.³ A61K *7/16;* **A23L** *1/226, 1/234, 1/235*

U.S. Cl. 424—49 **3 Claims**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff, chewing gum, toothpaste or medicinal product comprising the step of adding to a toothpaste, chewing gum, foodstuff or medicinal product, an aroma or taste augmenting or enhancing quantity of at least one methyl-thio-2-methyl-2-pentenoate defined according to the structure:

wherein the wavy lines represent covalent bonds juxtaposed in a "cis" or "trans" configuration around the carbon-carbon double bond of the structure, the concentration of said methyl-thio-2-methyl-2-pentenoate in said foodstuff, chewing gum, toothpaste or medicinal product being from about 0.5 ppm up to about 100 ppm.

4,404,185

SLOW RELEASE FORMULATIONS OF PHEROMONES CONSISTING OF ALDEHYDES

Sergio Maccone; Anacleto Dal Moro, both of Milan; Mario Pirozzi, S. Donato Milanese, and Amedeo Capizzi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed May 6, 1982, Ser. No. 375,549

Claims priority, application Italy, May 7, 1981, 21551 A/81

Int. Cl.³ A01N *25/00;* **C07C** *143/02*

U.S. Cl. 424—84 **14 Claims**

1. A slow release formulation of pheromones consisting of aldehydes, comprising bisulphite adducts of the aldehydes and a buffer solution having a pH value ranging from 2 to 10.

4,404,186

VACCINES OBTAINED FROM BACTERIAL MUTANT STRAINS

Eliora Z. Ron, Tel Aviv, Israel, assignor to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Filed Mar. 20, 1981, Ser. No. 245,954

Claims priority, application Israel, Mar. 9, 1980, 59663

Int. Cl.³ A61K *39/108;* **C12N** *1/20, 15/00, 13/00*

U.S. Cl. 424—92 **5 Claims**

1. A live vaccine for the vaccination of poultry and mam-

mals against variety of gram negative pathogens belonging to Enterobacteriaceae, comprising a bacterial deletion mutant *E. coli* LR-2 derived from a non-pathogenic strain of *E. coli*, and a carrier therefor.

4. A process for immunizing poultry and mammals against Enterobacteriaceae which comprises applying to the avian or to the mammal an effective dose of a vaccine according to claim 1, by oral route or as aerosol.

4,404,187

METHOD FOR RENDERING FACTORS II AND VII HEPATITIS-SAFE WITH A CHELATING AGENT

Horst Schwinn; Norbert Heimburger, both of Marburg; Gerhardt Kumpe, Wetter, and Hans M. Preis, Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Nov. 19, 1981, Ser. No. 323,116

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1980, 3043857

Int. Cl.³ A61K *35/14*

U.S. Cl. 424—101 **5 Claims**

1. A method for making a preparation containing at least one member selected from the group consisting of blood clotting Factor II and blood clotting factor VII virtually hepatitis-safe, which method comprises warming said preparation in the presence of an effective amount of a chelating agent and in the further presence of at least one member selected from the group consisting of amino acids, saccharides, and sugar alcohols.

4,404,188

PURIFIED MULLERIAN INHIBITING SUBSTANCE AND METHOD OF PURIFICATION

Patricia K. Donahoe, Weston; Gerald P. Budzik, Waltham, and David A. Swann, Lexington, all of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Jul. 29, 1981, Ser. No. 287,943

Int. Cl.³ A61K *35/48*

U.S. Cl. 424—105 **6 Claims**

1. A process for purifying Mullerian Inhibiting Substance (MIS) from testicular tissue which comprises:

(A) incubating testicular tissue in an appropriate aqueous culture media in the presence of a protease inhibitor for a time sufficient to extract MIS from said tissue into said media while avoiding substantial cellular disruption;

(B) chromatographing an aqueous solution of the extracted MIS on an anionic exchange resin and collecting unbound fractions containing said biologically active MIS;

(C) chromatographing said unbound biologically active fractions from said anionic exchange resin on a cationic resin and collecting unbound fractions containing said biologically active MIS.

4,404,189

SYNERGISTIC ANTIMICROBIAL COMPOSITIONS

Gabor Kulcsar; Gyula Sebestyen; Agoston David, and Tibor Zilahi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Jan. 21, 1981, Ser. No. 226,615

Int. Cl.³ A61K *35/00*

U.S. Cl. 424—114 **2 Claims**

1. A synergistic antibacterial composition which consists essentially of a synergistic combination of pharmaceutically effective amounts of primycin or a pharmaceutically acceptable acid addition salt thereof in the range of 5 to 50% by weight and of sisomicin or a pharmaceutically acceptable acid addition salt thereof in the range of 95 to 50% by weight.

4,404,190

COMPOSITION OF MATTER AND PROCESS

Lester A. Dolak, Cooper Township, Kalamazoo County; Fritz Reusser, Portage; Thomas M. Castle, Cooper Township, Kalamazoo County; Betty R. Hannon, Kalamazoo Township, Kalamazoo County; Alice L. Laborde, Kalamazoo, and Charles K. Marschke, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 22, 1982, Ser. No. 341,437

Int. Cl.³ A61K *35/00*; C12P *1/06*

U.S. Cl. 424—118 **4 Claims**

1. Antibiotic U-64,846, which is active against Gram-positive bacteria, and which in its essentially pure form has the following characteristics:

(a) molecular weight of 486 (mass spectrometry);

(b) color and form of pure solid: white

(c) is highly soluble in 1:1 water:methanol and in glacial acetic acid and in water alone;

(d) a characteristic ^{13}C-NMR spectrum as shown in FIG. 3 of the drawings;

(e) a characteristic UV spectrum as shown in FIG. 2 of the drawings;

(f) a characteristic infrared absorption spectrum when dissolved in a mineral oil mull is shown in FIG. 1 of the drawings;

(g) has a molecular formula $C_{18}H_{35}ClN_4O_5$; and

(h) a melting point of 350° C. with decomposition.

4,404,191

VIRUCIDAL METHOD

Jutta Sporkenbach; Heinz Eggensperger, both of Hamburg; Lothar Bücklers, Norderstedt; Helmut H. Ehlers, Hamburg; Ulrich Eigener, Henstedt-Ulzburg, and Hans-Peter Harke, Hamburg, all of Fed. Rep. of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,557

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046769

Int. Cl.³ A01N *59/00*; A61K *33/40*; A01N *59/02*; A61K *33/04*; A01N *65/00*; A61K *33/00*

U.S. Cl. 424—130 **7 Claims**

1. A method for inactivating viruses which comprises contacting the viruses located on inanimate surfaces or on the skins of humans or non-human animals with an antivirally effective amount of a salt of peroxymonosulfuric acid selected from the group consisting of alkali metal salt, alkaline-earth metal salt and ammonium salt.

4,404,192

PROCESS FOR PREPARING COMPOSITIONS FOR PERFUSING ARTIFICIAL KIDNEY SYSTEMS FOR DIALYSIS

Takeshi Suzuki, Itano, Japan, assignor to Tomita Pharmaceutical Corporation, Limited, Tokushima, Japan

PCT No. PCT/JP80/00186, § 371 Date Apr. 27, 1981, § 102(e) Date Apr. 14, 1981, PCT Pub. No. WO81/00515, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 20, 1980, Ser. No. 253,931

Claims priority, application Japan, Aug. 27, 1979, 54-109365

Int. Cl.³ A61K *33/06, 33/14*

U.S. Cl. 424—153 **2 Claims**

1. A process for preparing a composition having low hygroscopicity, in the form of uniform particles and useful for perfusing artificial kidney systems from compounds to give an electrolyte ion composition comprising 126–145 mEq/l of Na^+, 1.5—3.0 mEq/l of K^+, 2.5–4.0 mEq/l of Ca^{++}, 1.0–1.5 mEq/l of Mg^{++}, 98–108 mEq/l of Cl^- and 30–4.52 mEq/l of CH_3COO^-, said process comprising dissolving the compounds in warm water having a temperature of about 35° to 40° C., allowing the solution to stand for at least 6 hours, and thereafter spray-drying the resulting aqueous solution of mixed salts by spraying the solution into a drying chamber having an

inlet temperature of 200° to 400° C. from the orifice of a spray nozzle having an orifice diameter of 1.0 to 2.0 mm to form said composition.

4,404,193

METHYLDOPA COMPOSITION

Robert E. Dempski, Dresher, and Joseph L. O'Neill, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 965,462, Dec. 1, 1978, abandoned. This application Oct. 9, 1981, Ser. No. 309,956

Int. Cl.[3] A61K *31/195, 31/715*

U.S. Cl. 424—176 4 Claims

1. A pharmaceutical composition for the oral treatment of hypertension comprising an aqueous suspension containing about 50 mg of methyldopa per ml of said suspension, about 500 mg of sucrose per ml of said suspension such that the weight ratio of methyldopa:sucrose is about 1:10.

4,404,194

IMMUNO-SUPPRESSIVE SUBSTANCE, ITS ISOLATION PROCESS, AND ITS THERAPEUTIC USE

Mario Arala-Chaves, Lisbon, Portugal, assignor to Berri-Balzac, Suresnes, France

Filed Jul. 21, 1981, Ser. No. 285,567

Claims priority, application France, Jul. 28, 1980, 80 16582

Int. Cl.[3] C07G *7/00;* A61K *37/00*

U.S. Cl. 424—177 5 Claims

1. Protein obtained from the products secreted by microorganisms, having immuno-suppressive activity and the following physico-chemical properties:

(1) isoelectric point: 4.25,

(2) ultraviolet absorption spectrum: as shown in FIG. 1, with a maximum at 260 nm,

(3) molecular mass: about 90,000 daltons as estimated by measuring the migration on a polyacrylamide gel,

(4) can be stained by Coomasie blue but not by Methylene blue or PAS,

(5) desoxyribonuclease, ribonuclease A and neuraminidase proof and degradable by α, γ and δ chymotrypsins and trypsin.

4,404,195

POLY CATION SALTS OF MONOHEXOSETHIO (OR OXY) ALKYL DIAMIDES

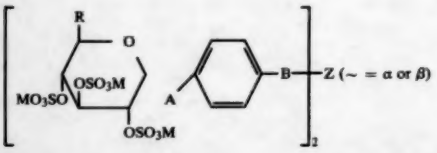
Robert E. Schaub, Upper Saddle River, N.J.; Janis Upeslacis, Pomona, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,049

Int. Cl.[3] A61K *31/70;* C07H *15/26*

U.S. Cl. 424—180 29 Claims

1. A compound selected from those of the formula:



wherein M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, aluminum, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); A is selected from the group consisting of —S— and —O—; B is selected from the group consisting of —NHCO—, —$NHSO_2$— and —$NHCH_2$—; R is selected from the group consisting of CH_2OSO_3M, $COOCH_3$ and COOM; and Z is a straight or branched chain alkylidene group —$(CH_2)_m$—, where m is an integer 0–12, inclusive, with the proviso that when m is zero or one, B cannot be —$NHSO_2$—.

17. A method of modulating the complement system in a warm-blooded animal which comprises administering to said warm-blooded animal an effective complement modulating amount of a pharmaceutically acceptable compound selected from those of the formula of claim 1.

4,404,196

ANTIMICROBIAL OINTMENT

William H. Daudt; Cecil L. Frye, both of Midland, Mich., and James F. Hyde, Marco Island, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 78,415, Sep. 24, 1979. This application Jun. 26, 1981, Ser. No. 277,785

Int. Cl.[3] A01N *55/00;* A61K *31/695;* A61L *23/00*

U.S. Cl. 424—184 2 Claims

1. An antimicrobial ointment which comprises a suitable ointment base and particles of amorphous materials, which amorphous materials are prepared by removing the volatiles from a solution prior to combining with an ointment base, which solution is an aqueous metal ammine siliconate solution which is comprised of the reaction products of (a) oxides and hydroxides of metal, metal derivatives or mixtures thereof which are selected from a group consisting essentially of metals of group IB and metals of group IIB of the Periodic Table of Elements, which are not more acidic than the silanols and siloxanols produced in (c), which dissolve in the reaction mixture to yield metal ammine cations in the presence of R—NH_2; (b) R—NH_2 where R is H, aminoalkyls with 2–6 carbon atoms, or mixtures thereof and wherein the —NH_2 molar concentration is equal to at least n times the molar concentration of the metal or metal derivative where n is the coordination number of the metal; (c) a mono-organosilicon material which can undergo hydrolysis in the presence of the other reactants to yield mono-organosilanols or siloxanols and hydrolysis products which are not more acidic than the silanols or sloxanols wherein the organo moiety in the mono-organosilicon material contains up to about 50 carbon atoms and is selected from the group consisting of saturated and unsaturated hydrocarbons having from 1 to 6 carbon atoms, halohydrocarbons having up to 6 carbon atoms and wherein the halo substitution is at a location other than the alpha or beta locations, aminohydrocarbons, radicals containing one or more ether or thioether linkages, hydroxyfunctional alkyl radicals, carbomethoxyalkyl radicals, carbamoylalkoxy radicals, quaternary ammonium or phosphonium bearing alkyl radicals and mixtures thereof, the mono-organosilicon material being present in an amount sufficient to yield a silicon/metal ratio of from about 1 to about 10; and (d) water.

4,404,197

ANTIMICROBIAL COMPOSITIONS CONTAINING 1-ETHYL-6-FLUORO-1,4-DIHYDRO-4-DIHYDRO-4-OXO-7-(1-PIPERAZINYL)-3-QUINOLINE CARBOXYLIC ACID OR METAL SALTS THEREOF AND SILVER SULFADIAZINE

Charles L. Fox, Jr., Saw Mill Rd., Sherman, Conn. 06784, and Shanta M. Modak, 184 Howland Ave., River Edge, N.J. 07661

Filed May 15, 1981, Ser. No. 264,096

Int. Cl.[3] A61K *31/625*

U.S. Cl. 424—229 2 Claims

1. A composition useful in burn therapy which comprises about 3 mM silver salt of 1-ethyl-6-fluoro-1,4-dihydro-4-oxo-7-(1-piperazinyl)-3-quinoline carboxylic acid, about 30 mM silver sulfadiazine, and a physiologically acceptable carrier.

4,404,198
PHENYL SALICYLATE AS A TOPICAL ANTI-INFLAMMATORY

Kane L. Kelley, Roselle, N.J., assignor to Beecham Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 142,873, Apr. 23, 1980, abandoned, which is a continuation of Ser. No. 5,963, Jan. 24, 1979, abandoned. This application Feb. 12, 1981, Ser. No. 233,767

Int. Cl.³ A61K *31/605, 31/60*

U.S. Cl. 424—235 16 Claims

1. A method of treating inflammation in humans and animals which comprises topically applying to the inflamed area an anti-inflammatory amount of a composition which comprises from about 0.1% to about 10.0% of phenyl salicylate in combination with a pharmaceutically acceptable carrier suitable for topical application to the skin of a human or animal.

4,404,199
SALIFICATION PRODUCTS OF CHOLIC ACIDS WITH TRIMETHOXY-3,4,5-BENZOIC ESTER OF 2-PHENYL-2-DIMENTHYLAMINOBUTANOL, HAVING PHARMACOTHERAPEUTIC ACTION, PROCESS FOR THEIR PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THEM AS ACTIVE PRINCIPLE

Antonio Bonaldi, Chiuduno; Egidio Molinari, Longone Al Segrino, and Vanna Springolo, Milan, all of Italy, assignors to Erregierre S.p.A., Bergamo, Italy

Filed May 3, 1982, Ser. No. 374,243

Claims priority, application Italy, May 21, 1981, 21867 A/81

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—238 11 Claims

1. A salt of a cholic acid, selected from the group consisting of chenodeoxycholic acid and ursodeoxycholic acid, with the trimethoxy-3,4,5-benzoic ester of 2-phenyl-2-dimethylaminobutanol.

11. A therapeutic composition for the treatment of diskinesiae, biliary dyspepsiae, cholecystopathies, and for the normalization of the gastro-biliary tract kinesis, comprising a therapeutically effective amount of a salt of a cholic acid, selected from the group consisting of chenodeoxycholic acid and ursodeoxycholic acid, with the trimethoxy-3,4,5-benzoic ester of 2-phenyl-2-dimethylaminobutanol, in the molar ratio 1:1 or 2:1, and a pharmaceutically acceptable carrier.

4,404,200
4-PREGNENE-DERIVATIVES, A PROCESS FOR THEIR PREPARATION, COMPOSITION AND METHOD FOR THE TREATMENT OF INFLAMMATORY CONDITIONS

Bror A. Thalen, Bjärred, and Ralph L. Brattsand, Lund, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

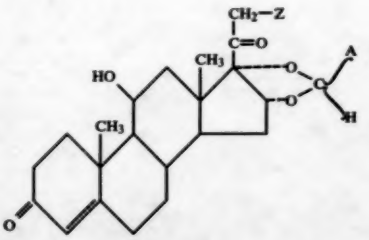
Filed Nov. 17, 1981, Ser. No. 322,592

Claims priority, application Sweden, Dec. 4, 1980, 8008524

Int. Cl.³ A61K *31/58*

U.S. Cl. 424—241 22 Claims

1. A compound of the formula



(I)

in the form of a stereoisomeric mixture or an epimer of the R or S type regarding the orientation of the substituents in the carbon atom at position 22, in which formula A is n-propyl or n-butyl and Z is hydroxyl or hydroxyl esterified with a fatty acid with a straight or branched hydrocarbon chain having 1–5 carbon atoms.

4,404,201
CEPHALOSPORINS

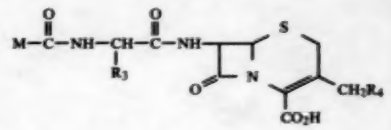
Theodore H. Haskell, Ann Arbor, and Marland P. Hutt, Saline, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 13, 1981, Ser. No. 321,021

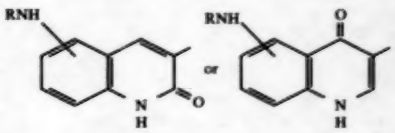
Int. Cl.³ A61K *31/545*; C07D *501/34*

U.S. Cl. 424—246 15 Claims

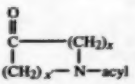
1. A compound of the formula



and pharmaceutically acceptable salts thereof; wherein M is

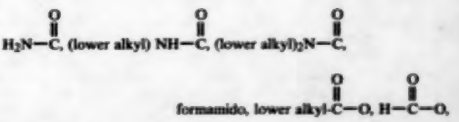


RNH is in the 6 or 7 position; R is

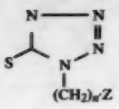


or R_1-(R_5N-acyl)$_n$; x is an integer from one to five, x' is zero, one or two; R_1 is hydrogen, lower alkyl, benzyl, or

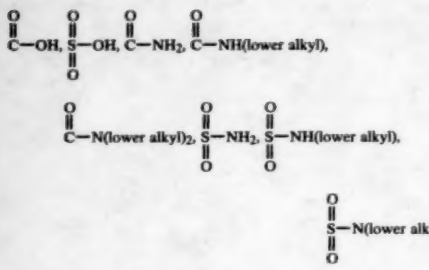
wherein R_2 is hydrogen; amino or a lower alkyl group of from one to four carbon atoms, optionally substituted by from one to three chlorine or fluorine atoms; R_5 is hydrogen or lower alkyl and N-acyl is an aminoacyl moiety derived from a carboxylic acid of from two to ten carbon atoms optionally substituted by from one to three of the following groups, hydroxyl, carboxy,



amino, alkylamido, carbamido, carbonyl oxygen, lower alkoxy, lower alkylthio or sulfonic acid, n is an integer of from one to four; R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl and R_4 is acetoxy, carbamoyloxy, or a heterocyclicthio group where the heterocyclic moiety is an optionally methyl substituted thiadiazolyl, tetrazolyl group or the heterocyclicthio group has the formula



wherein Z is



or CH_2-OH and n' is an integer of from one to four.

14. A pharmaceutical composition comprising an antibacterially-effective amount of a compound of claim **1** and a pharmaceutical carrier.

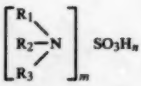
4,404,202

ANTIHYPERTENSION TREATMENT AND COMPOSITION THEREFOR

Jose A. A. Alvarez, Carpatos, Mexico, and Ralph B. Thompson, Oak Brook, Ill., assignors to T & R Chemicals, Inc., Clint, Tex.

Filed Jan. 5, 1982, Ser. No. 337,103
Int. Cl.[3] **A61K** *31/13, 31/535, 31/44*
U.S. Cl. 424—248.5 **9 Claims**

1. A method of treating hypertension in a human suffering from said condition comprising introducing into said human an antihypertensively effective amount of at least one compound of the formula:



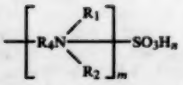
where:

R_1 is selected from the group consisting of lower alkyl radicals, cycloalkyl radicals containing from 6 to 10 carbon atoms each, lower monohydroxyalky radicals, and aralkyl radicals,

R_2 is selected from the group consisting of lower alkyl radicals, lower monohydroxyalkyl radicals, and hydrogen,

R_1 and R_2 together can constitute a ring selected from the group consisting of morpholine, piperidine, and hexamethyleneimine, provided that each such ring can be substituted on one of its carbon atoms by a lower alkyl radical,

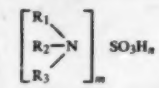
R_3 is selected from the group consisting of lower alkyl radicals, lower monohydroxyalkyl radicals, hydrogen, and radicals of the formula:



in which R_4 is a divalent saturated lower aliphatic radical,

m and n are integers, the sum of m and n is 2, and n is either 0 or 1.

6. A pharmaceutical composition for the treatment of hypertension consisting essentially of an antihypertensive-effective amount of a compound of the formula



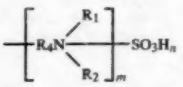
where:

R_1 is selected from the group consisting of lower alkyl radicals, cycloalkyl radicals containing from 6 to 10 carbon atoms each, lower monohydroxyalky radicals, and aralkyl radicals,

R_2 is selected from the group consisting of lower alkyl radicals, lower monohydroxyalkyl radicals, and hydrogen,

R_1 and R_2 together can constitute a ring selected from the group consisting of morpholine, piperidine, and hexamethyleneimine, provided that each such ring can be substituted on one of its carbon atoms by a lower alkyl radical,

R_3 is selected from the group consisting of lower alkyl radicals, lower monohydroxyalkyl radicals, hydrogen, and radicals of the formula:



in which R_4 is a divalent saturated lower aliphatic radical,

m and n are integers, the sum of m and n is 2, and n is either 0 or 1,

together with a pharmaceutically acceptable carrier or diluent.

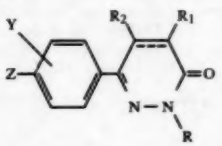
4,404,203

SUBSTITUTED 6-PHENYL-3(2H)-PYRIDAZINONES USEFUL AS CARDIOTONIC AGENTS

Ila Sircar, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 14, 1981, Ser. No. 263,643
Int. Cl.[3] **C07D** *237/14, 237/04, 237/24;* **A61K** *31/50*
U.S. Cl. 424—250 **3 Claims**

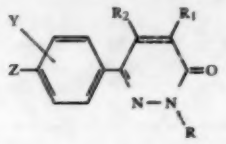
1. A compound having the structural formula:



wherein ═══ represents a double or single bond between two carbon atoms; R is hydrogen, lower alkyl, $—CH_2C_6H_5$ or $—C_6H_5$; and when R_1 is hydrogen, R_2 is CF_3, $—CH_2C_6H_5$, CN, CO_2H, $CON(R_3)_2$, $CH_2N(R_3)_2$,—CH_2OH, $N(R_3)_2$, and when R_2 is hydrogen, R_1 is $—CF_3$, —CN, $CON(R_3)_2$, $CH_2N(R_3)_2$, $N(R_3)_2$, wherein R_3 is hydrogen or lower alkyl; Y and Z are hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, phenoxy, sulfonamido; wherein lower alkyl and lower alkoxy contain 1 to 3 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

3. The method for increasing cardiotonic contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form in a

pharmaceutically acceptable carrier to such a patient an effective amount of a compound having the structure:



wherein represents a single or double bond between two carbon atoms; R is hydrogen, lower alkyl, $-CH_2C_6H_5$ or $-C_6H_5$; and when R_1 is hydrogen, R_2 is CF_3, CN, CO_2H, $CON(R_3)_2$, $CH_2N(R_3)_2$,—CH_2OH, $N(R_3)_2$, and when R_2 is hydrogen, R_1 is $-CF_3$, —CN, $CON(R_3)_2$, $CH_2N(R_3)_2$, $N(R_3)_2$, wherein R_3 is hydrogen or lower alkyl Y and Z are hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy, phenoxy, sulfonamido; wherein lower alkyl and lower alkoxy contain 1 to 3 carbon atoms; and the pharmaceutically acceptable acid addition salts thereof.

4,404,204

PYRIDAZINO[4,5-B]QUINOXALINE-5,10-DIOXIDE DERIVATIVES, A PROCESS FOR PREPARING SAME AND ANTI-MICROBIAL COMPOSITIONS CONTAINING SAME

Pal Benko; Daniel Bozsing; Janos Gundel, and Karoly Magyar, all of Budapest, Hungary, assignors to Patentbureau DANUBIA, Hungary

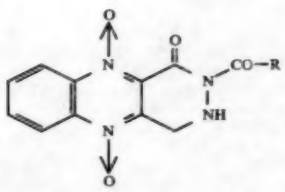
Filed Jun. 19, 1981, Ser. No. 275,393

Claims priority, application Hungary, Jul. 25, 1980, 1862/80

Int. Cl.[3] **C07D** *487/04, 241/52, 401/12;* **A61K** *31/495*

U.S. Cl. 424—250 **6 Claims**

1. Pyridazino[4,5-b]quinoxaline-5,10-dioxide derivatives of the formula I



I

wherein

R represents a C_{1-20} alkyl, a C_{1-6} alkoxy group, a C_{6-10} aryl group optionally mono or disubstituted by C_{1-6} alkoxy, C_{1-6} alkyl, nitro, amino, hydroxy or halogen, a phenyl-C_{1-3} alkyl/, a C_{3-7} cycloalkyl or a 5 or 6 membered heterocyclic group containing one or two nitrogen and/or oxygen and/or sulfur atoms and selected from the group consisting of 2-, 3- or 4-pyridyl, pyrazinyl, pyridazinyl, furyl, thienyl, thiazoiyl and imidazolyl groups, and biologically acceptable acid addition salts of the compouns of the formula I.

4. Compositions for use in animal husbandry as a fodder additive and/or as an anti-bacterial agent comprising as active ingredient an effective amount of a compound of the formula I, wherein R has the same meanings as defined in claim 1, or a biologically acceptable acid addition salt thereof in admixture with suitable inert solid or liquid carriers or diluents.

4,404,205

2-OXO-2,6,7,8,9,10 HEXAHYDRO-PYRIMIDO[1,2-a]AZEPINES AND ANTIANGINAL METHOD OF USE THEREOF AND OF 4-OXO-4,6,7,8,9,10-HEXAHYDROPYRIMIDO[1,2-a]AZEPINES

Jozsef Kökösi, Budaors; Istvan Hermecz, Budapest; Zoltan Meszaros, Budapest; Gyorgy Szasz, Budapest; Lelle Vasvari nee Debreczy, Budapest; Agnes Horvath, Budapest, and Tibor Breining, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT., Budapest, Hungary

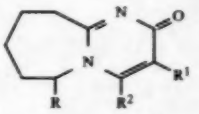
Filed May 9, 1980, Ser. No. 148,234

Claims priority, application Hungary, May 11, 1979, CI 1931

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/305*

U.S. Cl. 424—251 **5 Claims**

1. A compound of the formula II



(II)

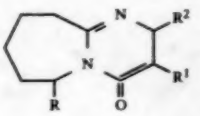
or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof wherein the quaternizing group is a lower alkyl, phenyl or lower alkyl phenyl group and wherein

R is hydrogen or lower alkyl,

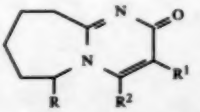
R^1 is C_1 to C_4 alkyl, phenyl, carboxyl, C_1 to C_4 alkoxycarbonyl, nitrile, carbamoyl or carbohydrazido; and

R^2 is hydrogen or C_1 to C_4 alkyl.

4. An anti-anginal method of treatment which comprises the step of administering to an animal suffering from angina a pharmaceutically effective amount of a compound of the formula (I)



or formula (II)



or a mixture thereof or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof wherein the quaternary group is a lower alkyl, phenyl or lower alkyl phenyl group; and

wherein

R^1 is C_1 to C_4 alkyl, phenyl, carboxyl, C_1 to C_4 alkoxycarbonyl, nitrile, carbamoyl, or carbohydrazido; and

R^2 is hydrogen or C_1 to C_4 alkyl.

4,404,206

SUBSTITUTED IMINOACID DERIVATIVES, PROCESS FOR PREPARING THEM AND THEIR USE AS ENZYME INHIBITORS

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to Science Union et Cie, Suresnes, France

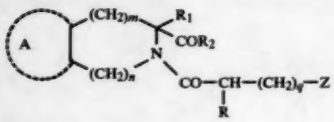
Filed Dec. 3, 1980, Ser. No. 212,607

Claims priority, application France, Dec. 7, 1979, 79 30046; Jul. 31, 1980, 80 16875

Int. Cl.³ A61K *31/47;* **C07D** *217/16*

U.S. Cl. 424—258 **7 Claims**

1. A compound selected from the group consisting of bicyclic iminoacids of the formula I



(I)

wherein

A, m, and n are selected to provide a perhydroquinoline or perhydroisoquinoline ring system,

q represents 0 or the number 1 or 2,

R is hydrogen, methyl, or benzyl,

R_1 is hydrogen or lower-alkyl of no more than 5 carbon atoms,

R_2 is hydroxyl or lower-alkoxy of no more than 5 carbon atoms, and

Z is carboxyl, cyano, hydroxyl, sulfhydryl, or amino, in racemic or optically-active form, and pharmaceutically-acceptable addition salts thereof, when R_2 is hydroxy with a mineral or organic base and, when Z is amino, with an acid.

7. A method of treating high blood pressure and cardiac failure in a subject, which consists in administering to said subject an effective amount of a compound of claim 1 or a salt thereof together with a therapeutically suitable carrier.

4,404,207

ANTIMICROBIAL 8-SUBSTITUTED BENZO [IJ]QUINOLIZINES

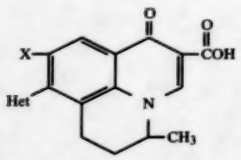
Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 6, 1981, Ser. No. 318,929

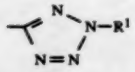
Int. Cl.³ A01N *43/42;* **A61K** *31/47;* **C07D** *455/04*

U.S. Cl. 424—258 **11 Claims**

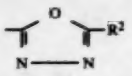
1. A compound of the formula



wherein Het is selected from the group consisting of 1-pyrryl, tetrazolyl of the formula



wherein R^1 is lower alkyl or benzyl, and oxadiazolyl of the formula



wherein R^2 is lower alkyl, trifluoromethyl or —NHϕ; X is hydrogen, or when Het is pyrryl, X may also be fluoro; or a pharmaceutically-acceptable carboxylate salt thereof, or an alkyl or alkylaminoalkyl ester thereof having one to four carbon atoms in the alkyl group.

11. A method of inhibiting the growth of microorganisms comprising contacting said microorganisms with an effective amount of a compound according to claim 1.

4,404,208

ANALGESIC MIXTURE OF NALBUPHINE AND TIFLAMIZOLE

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,803

Int. Cl.³ A61U *31/415, 31/485*

U.S. Cl. 424—260 **16 Claims**

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) tiflamizole, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.0046 to about 1:0.62.

4,404,209

ANALGESIC MIXTURE OF NALBUPHINE AND SULINDAC

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,804

Int. Cl.³ A61K *31/19, 31/185, 31/485*

U.S. Cl. 424—260 **16 Claims**

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) sulindac, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.1 to about 1:400.

4,404,210

ANALGESIC MIXTURE OF NALBUPHINE AND IBUPROFEN

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,807

Int. Cl.³ A61K *31/19, 31/485*

U.S. Cl. 424—260 **16 Claims**

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) ibuprofen, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.40 to about 1:79.

4,404,211

ANALGESIC MIXTURE OF NALBUPHINE AND FLURBIPROFEN

William K. Schmidt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 30, 1982, Ser. No. 393,809

Int. Cl.³ A61K *31/19, 31/485*

U.S. Cl. 424—260 **16 Claims**

1. A pharmaceutical composition comprising a combination of (a) nalbuphine, or a pharmaceutically acceptable salt thereof, and (b) flurbiprofen, or a pharmaceutically suitable salt thereof, in which the weight ratio of (a):(b) is from about 1:0.027 to about 1:15.

4,404,212

PROSTACYCLIN TREATMENT OF THROMBOSIS

Salvador E. Moncada, West Wickham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 907,355, May 18, 1978, Pat. No. 4,337,254. This application Jul. 2, 1981, Ser. No. 280,263

Claims priority, application United Kingdom, Aug. 23, 1977, 35261/77

Int. Cl.³ A61K *31/505, 31/52, 31/44, 31/34*

U.S. Cl. 424—251 7 Claims

1. A method for the treatment or prophylaxis of thrombosis in a mammal in need thereof, which comprises simultaneously or sequentially internally administering 1 part by weight of (a) a compound selected from the group consisting of prostacyclin, dihydroprostacyclin, and their pharmaceutically acceptable salts, in an amount insufficient to cause vasodilation, and 1 to 200 parts by weight of (b) a phosphodiesterase inhibitor.

4,404,213

DERIVATIVES OF CERTAIN PYRIDYLIMINOMETHYL-BENZENES

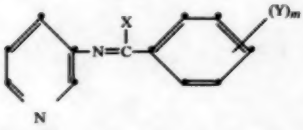
Pieter Ten Haken, Eastling, Nr Faversham, and Shirley B. Webb, Sheldwich, Nr Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 228,427, Jan. 26, 1981, Pat. No. 4,355,035, which is a continuation of Ser. No. 130,681, Mar. 17, 1980, abandoned. This application Apr. 12, 1982, Ser. No. 367,210

Int. Cl.³ A01N *43/40;* C07D *213/74*

U.S. Cl. 424—263 7 Claims

1. A compound of the formula



wherein X is alkylthio of from one to six carbon atoms; m is 1 or 2; and Y is halogen, and acid-addition salts thereof.

5. A method of protecting a crop from fungal attack comprising treating crops subject to or subjected to fungal attack, seeds of such crops or soil in which such crops are growing or are to be grown with a fungicidally effective amount of a compound according to claim 1, or a composition according to claim 4.

4,404,214

2-PYRIDINECARBOXAMIDE DERIVATIVES COMPOSITIONS CONTAINING SAME AND METHOD OF USING SAME

Mikio Takeda, Urawa; Yasushi Honma, Ageo, and Kei Tsuzurahara, Omiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

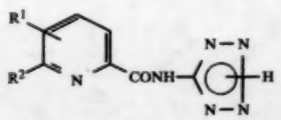
Filed Nov. 20, 1981, Ser. No. 323,289

Claims priority, application Japan, Dec. 5, 1980, 55-172246

Int. Cl.³ C07D *401/12;* A61K *31/455*

U.S. Cl. 424—266 24 Claims

1. A 2-pyridinecarboxamide derivative of the formula:



wherein R^1 is hydrogen, lower alkyl, lower alkoxy or halogen and is in the 3rd-, 4th- or 5th-position of the pyridyl group, and R^2 is hydrogen, lower alkyl, lower alkoxy, phenyl-lower alkyl, phenyl-lower alkenyl or halogen, or a pharmaceutically acceptable salt thereof.

13. A method of treatment of allergic symptoms in a warm-blooded animal which comprises administering thereto a therapeutically effective amount of a derivative of claim 1.

4,404,215

PIPERIDYL PHENYL TRIFLUOROETHANOLS

Michel Vincent, Bagneux; Georges Remond, Versailles, and Jacques Bure, Neuilly-sur-Seine, all of France, assignors to Science Union et Cie, Suresnes, France

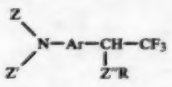
Division of Ser. No. 90,635, Nov. 2, 1979, abandoned. This application Nov. 18, 1981, Ser. No. 322,513

Claims priority, application France, Nov. 3, 1978, 78 31096

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 10 Claims

1. The *aaa*-trifluoro (aminoaryl) ethanols having the formula I:



(I)

wherein

Z is an N-lower alkylpiperidine radical or an N-(phenyl lower alkyl)piperidine radical,

Z′ is a hydrogen or a lower alkyl radical,

Z″ is an oxygen atom,

Ar is phenyl, and

R is hydrogen.

5. A pharmaceutical composition useful for the treatment of inflammation incorporating as active ingredient an anti-inflammatory pain-alleviating effective amount of a compound of claim 1.

9. A method for the alleviation of pain and inflammation in a patient suffering therefrom, comprising the step of administering to said patient an effective anti-inflammatory pain-alleviating effective amount of a compound of claim 1.

4,404,216

ANTIFUNGAL 1,3-BIS-TRIAZOLYL-2-PROPANOL DERIVATIVE

Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,866

Claims priority, application United Kingdom, Jun. 6, 1981, 8117379; Oct. 17, 1981, 8131370; Mar. 4, 1982, 8206329

Int. Cl.³ A01N *43/64;* A61K *31/41;* C07D *249/08*

U.S. Cl. 424—269 3 Claims

1. An antifungal compound selected from the group consisting of 2-(2,4-difluorophenyl)-1,3-bis(1H-1,2,4-triazol-1-yl)propan-2-ol and the pharmaceutically acceptable acid addition salts thereof.

3. A method for treating fungal infections in a warm-blooded animal, which comprises administering to said animal an effective antifungal amount of a compound as claimed in claim 1.

4,404,217

3-INDOLYL ALKYLENE AMINO PROPANOLS AND CARDIOVASCULAR COMPOSITIONS THEREOF

Henri Demarne, and Jean Wagnon, both of Montpellier, France, assignors to C. M. Industries, Paris, France

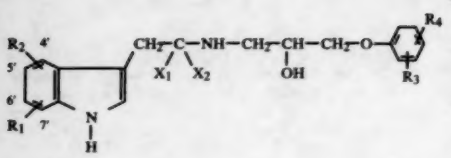
Filed Aug. 15, 1980, Ser. No. 178,550

Claims priority, application France, Sep. 17, 1979, 79 20907

Int. Cl.³ A61K *31/40;* C07D *209/12, 209/19*

U.S. Cl. 424—274 8 Claims

1. A chemical compound having the formula:



I

in which

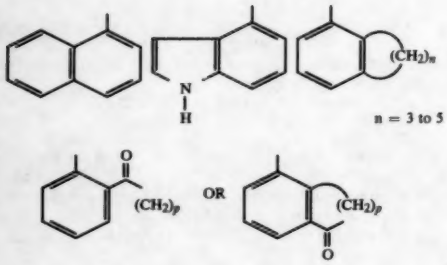
R_1 and R_2 each designate, independently, hydrogen, halo, a lower alkyl group having 1 to 5 carbon atoms, or a lower alkoxy group having 1 to 5 carbon atoms, occupying one of the positions 4' to 7' of the indole ring;

R_3 and R_4 considered independently designate hydrogen, a lower alkyl having 1 to 5 carbon atoms, a lower alkoxy having 1 to 5 carbon atoms, a halo group, or a nitro group;

or one of R_3 or R_4, but not both, designates an acyl R_5CO— group, an alkylthio R_5S— group or alkylsulfinyl R_5SO— or alkylsulfonyl R_5SO_2— group in which R_5 designates a lower alkyl group having 1 to 5 carbon atoms or cycloalkyl group having 3 to 6 carbon atoms, a $—(CH_2)_nCOOR_6$ group, $—(CH_2)_nCONH—R_6$ or $—(CH_2)_nNHCOOR_6$ or $—(CH_2)_nNHCOR_6$ group in which n represents an integer from 0 to 2 and R_6 designates a lower alkyl group having from 1 to 5 carbon atoms;

and when R_1 and R_2 or R_3 and R_4 are adjacent alkyl or alkoxy radicals, they are linear radicals;

or R_3 and R_4 taken together are in the form of a ring structure to constitute with the benzene ring to which they are bonded, a fused ring structure designating:



n = 3 to 5

p = 2 to 4

X_1 represents a lower alkyl group having 1 to 5 carbon atoms, a hydroxymethyl group or a $—COOR_7$ group in which R_7 represents hydrogen or a lower alkyl group having 1 to 5 carbon atoms;

X_2 represents hydrogen

and the pharmaceutically acceptable acid addition salts thereof.

2. A pharmaceutical composition suitable for inducing β-blocking activity in a host comprising as an active ingredient, an effective quantity of a compound of claim 1 together with a pharmaceutically acceptable carrier.

4,404,218

ANTIBIOTIC SF-2103A SUBSTANCE AND PROCESS FOR PRODUCTION THEREOF

Tatsuo Ito, Isehara; Takashi Shomura, Yokohama; Michio Kojima, Tokyo; Norio Ezaki, Yokohama; Masaji Sezaki, Tokyo, and Tomizo Niwa, Yokohama, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed Aug. 17, 1981, Ser. No. 293,063

Claims priority, application Japan, Aug. 19, 1980, 55-112996; Nov. 11, 1980, 55-157631

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/40*

U.S. Cl. 424—274 **3 Claims**

1. An antibiotic SF-2103A substance or non-toxic salt thereof, wherein the trisodium salt thereof has the following properties:

(1) Color and Appearance: Obtained as a white powder by freeze-drying;

(2) Melting Point: Shows no distinct melting point, and turns brown and decomposes forming bubbles at 168° C.;

(3) Specific Rotation: $[\alpha]_D^{20} - 16.3°$ (c 1, water);

(4) Elemental Analysis: Calculated for $C_9H_8NO_{10}S_2Na_3.2H_2O$

	Calculated (%)	Found (%)
C	23.53	23.62
H	2.61	2.44
N	3.05	3.00
O	41.83	42.16 (balance)
S	13.94	13.81
Na	15.03	14.97 (as determined by atomic absorption analysis)

(5) Ultraviolet Absorption Spectrum: As shown in FIG. 1, the maximum absorptions in a 0.02 M phosphate buffer (pH 7.2) are present at 266 to 267 nm ($E_{1\ cm}^{1\%} = 126$) and 230 nm ($E_{1\ cm}^{1\%} = 118$);

(6) Infrared Absorption Spectrum: The infrared absorption spectrum as determined by the potassium bromide tablet method is shown in FIG. 2 with absorption bands at 3450, 1755, 1610, 1390, 1220, 1080, 1040, 940, 900, 780 cm^{-1};

(7) Nuclear Magnetic Resonance Spectrum: The 100 MHz nuclear magnetic resonance spectrum as determined in heavy water with tetramethylsilane as an external standard is shown in FIG. 3 and has signals at δ1.55 (d, 3H), δ2.99 (dd, 1H), δ3.44 (dd, 1H), δ3.94 (dd, 1H), δ4.48 (m, 1H), and δ4.94 (m, 1H);

(8) Thin Layer Chromatography:

(a) Rf values on a cellulose thin layer (Cellulose F_{254}, produced by Merck & Co.) as developed at 5° C. with the following solvents:

Solvent	Rf
n-butanol/isopropanol/water (7/1/6 by volume)	0.30
70% by vol. n-propanol aqueous solution	0.52
70% by vol. ethanol aqueous solution	0.62
80% by vol. acetonitrile aqueous solution	0.37

(b) When developed on DEAE-cellulose (Polygram CEL 300 DEAE, produced by Mercherry Nagel Corp.) at 5° C. with a 0.02 M phosphate buffer (pH 7.2) containing 0.1 M sodium chloride, MC 696-SY2-A Substance as a control shows an Rf value of 0.31, whereas the SF-2103A substance shows an Rf value of 0.14;

(9) Solubility: Freely soluble in water, soluble in methanol; insoluble in ethyl acetate, chloroform, and benzene; and

(10) Color Reactions: Positive for the Lemieux and Ehrlich reagents, and negative for the Ninhydrin reagent.

3. An antibiotic composition comprising an antibiotic SF-2103A substance or a non-toxic salt thereof as in claim 1 or 2.

4,404,219

PHENYLGUANIDINE THERAPEUTIC AGENTS

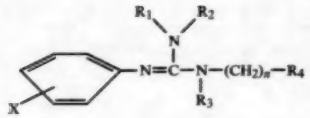
Jeffrey L. Ives, King of Prussia, Pa., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 135,374, Mar. 31, 1980, Pat. No. 4,281,004. This application Mar. 10, 1981, Ser. No. 242,200

Int. Cl.³ A61K *31/40*

U.S. Cl. 424—274 6 Claims

1. A method for lowering blood sugar in the treatment of a diabetic host, which comprises orally administering to said host an effective blood sugar lowering amount of a compound selected from the group consisting of phenylguanidine bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein

X is a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, lower alkyl and lower alkoxy;

R_1 and R_2, when taken together, complete a pyrrolidino ring;

R_3 is hydrogen or lower alkyl;

R_4 is a member selected from the group consisting of phenyl, and mono- and di-substituted phenyl wherein each substituent is chosen from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, lower alkyl and lower alkoxy; and

n is an integer of from zero to four, inclusive.

4,404,220

XANTHENONE-YL ESTERS OF PHOSPHORIC AND PHOSPHONIC ACIDS

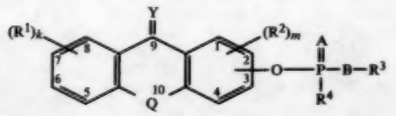
James T. Traxler, Evanston, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 127,007, Mar. 4, 1981, Pat. No. 4,299,772. This application Jul. 29, 1981, Ser. No. 287,839

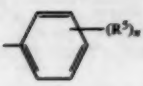
Int. Cl.³ C07D *335/14, 335/16;* A01N *43/18*

U.S. Cl. 424—275 3 Claims

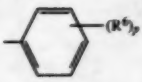
1. A compound of the formula:



Wherein R^1 and R^2 are each independently selected from the group consisting of halogen, lower alkyl, lower haloalkyl, nitro, lower alkylsulfinyl, lower alkylsulfonyl and cyano; k and m are integers from 0 to 3; Q is sulfur; Y is selected from the group consisting of oxygen and sulfur; R^3 is selected from the group consisting of lower alkyl and



wherein R^5 is selected from the group consisting of halogen, lower alkyl, lower haloalkyl, nitro and cyano; n is an integer from 0 to 3; R^4 is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, amino, lower alkylamino, lower dialkylamino and



wherein R^6 is selected from the group consisting of halogen, lower alkyl, lower haloalkyl, nitro and cyano; p is an integer from 0 to 3; and A and B are each independently selected from the group consisting of oxygen and sulfur, with the proviso that if R^4 is lower alkoxy, then one of A and B must be sulfur.

3. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects, a compound of claim 1.

4,404,221

2'-SUBSTITUTED-SPIRO[BENZOFURAN-2(3H),1'-CYCLOHEXANES] AND ITS PHARMACEUTICAL USE

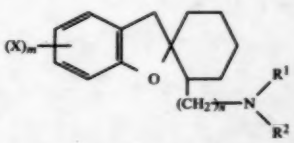
Edward J. Glamkowski, Warren, and Michael C. Jones, Somerville, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Oct. 19, 1981, Ser. No. 313,097

Int. Cl.³ A61K *31/34;* C07D *307/94*

U.S. Cl. 424—285 103 Claims

1. A compound of the formula



wherein X is hydrogen, halogen nitro, amino, alkyl-substituted amino, hydroxy, alkyl, and alkoxy, halogen being any of fluorine, chlorine, bromine and iodine; m is an integer of 1,2 or 3, X being the same or different when m is larger than 1; n is an integer of ∅, 1 or 2; and R^1 and R^2 are each independently hydrogen and alkyl; a stereoisomer thereof and a pharmaceutically acceptable acid addition salt of any of the foregoing.

96. A method of treatment which comprises administering to a depressed patient a pharmaceutically effective amount of a compound defined in claim 1.

4,404,222

PHENYLETHANOLAMINE DERIVATIVES AND ACID ADDITION SALTS THEREOF FOR ENHANCING THE GROWTH RATE OF MEAT-PRODUCING ANIMALS AND IMPROVING THE EFFICIENCY OF FEED UTILIZATION THEREBY

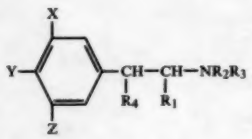
Pamela K. Baker, Hopewell, and Jane A. Kiernan, Kendall Park, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 181,254, Aug. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 143,069, Apr. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 66,908, Aug. 16, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,054

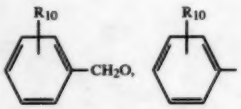
Int. Cl.[3] A61K *31/275, 31/135, 31/42, 31/40*

U.S. Cl. 424—304 17 Claims

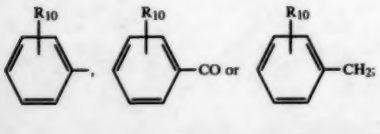
1. A method for increasing the growth rate of meat-producing animals and improving the efficiency of feed utilization comprising: orally or parenterally administering to said animals an effective amount to achieve the above-described body functions of a compound having the structure:



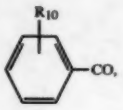
wherein, X is hydrogen, halogen or —CN; Y is hydrogen, NR_8R_9 or $NHCOR_5$; Z is hydrogen, halogen, OH, CN, CF_3, $COOR_1$, $CONH_2$, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, C_1–C_4 dialkylaminomethyl or hydroxymethyl; R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, C_3–C_6 alkyl or C_3–C_4 alkenyl; R_3 is hydrogen, C_1–C_6 alkyl, cyclohexyl, methoxypropyl, C_3–C_4 alkenyl or phenyl; with the provisos that when R_2 is C_3–C_5 alkyl or C_3–C_4 alkenyl, R_3 cannot be hydrogen, methyl or ethyl; when R_2 is hydrogen, R_3 cannot be C_1–C_5 alkyl and when R_3 is C_3–C_4 alkenyl, R_2 cannot be hydrogen; and when R_2 and R_3 are taken together with the nitrogen to which they are attached, they represent morpholino or N'—C_1—C_4 alkylpiperazino; R_4 is hydrogen, OH, OR_6 or SR_{11}; R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy,



or $N(R_1)_2$; R_6 is C_1–C_6 alkyl, C_2–C_5 alkanoyl,



R_8 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl; R_9 is hydrogen, C_1–C_6 alkyl, C_4–C_6 cycloalkyl, C_3–C_4 alkenyl, or benzyl; and when R_8 and R_9 are taken together with the nitrogen to which they are attached, they represent pyrrolidino; R_{10} is hydrogen, chloro, dichloro, methyl, dimethyl, methoxy, dimethoxy or nitro; R_{11} is C_1–C_6 alkyl, phenyl or benzyl; with the further provisos that when R_3 is phenyl, cyclohexyl or methoxypropyl R_2 is hydrogen; and when R_6 is alkanoyl or



R_2 and R_3 are substituents other than hydrogen, except when R_3 is an alkyl or substituted alkyl group which contains a tertiary carbon attached to nitrogen; and when R_8 is C_1–C_4 alkyl or C_3–C_4 alkenyl, R_9 is hydrogen, C_1–C_4 alkyl or C_3–C_4 alkenyl, and when Z is OH, X and Y are hydrogen; and that at least one of X, Y, and Z represents a substituent other than hydrogen; and when X is —CN, Z is —CN; and when Z is hydroxymethyl, R_4 is OH; and when Z is a group other than halogen, Y is NR_8R_9 or $NHCOR_5$; and when R_5 is $N(R_1)_2$, R_4 is OH; or racemic mixtures of the above-identified compounds, the optically active isomers or non-toxic, pharmacologically acceptable acid addition salts thereof.

4,404,223

PESTICIDAL FORMULATIONS

Michael D. Matthewson, Berkhamsted, England, assignor to Burroughs Wellcome Co., Raleigh, N.C.

Continuation of Ser. No. 43,491, May 29, 1979, abandoned. This application Apr. 6, 1981, Ser. No. 251,101

Claims priority, application United Kingdom, May 30, 1978, 24264/78; May 30, 1978, 24265/78

Int. Cl.[3] A01N *37/34, 37/00, 37/08*

U.S. Cl. 424—304 4 Claims

1. A pesticidal composition comprising the esters permethrin and decamethrin, each ester present in an amount to potentiate the other in a ratio of between 1:1 to 50:1 by weight respectively.

4,404,224

ALKANESULFONANILIDE DERIVATIVES AND PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF FOR INCREASING THE GROWTH RATE AND/OR IMPROVING THE LEAN MEAT TO FAT RATIO OF WARM BLOODED ANIMALS

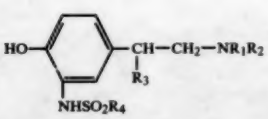
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 2, 1981, Ser. No. 326,878

Int. Cl.[3] C07C *143/74;* A61K *31/18*

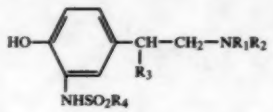
U.S. Cl. 424—321 7 Claims

1. A compound having the structural formula;



wherein R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, C_1–C_4 alkyl, benzyl, phenethyl or α,α-dimethylphenethyl; R_3 is SR_6, wherein R_6 is hydrogen, C_1–C_6 alkyl, benzyl, phenyl or allyl; R_4 is C_1–C_4 alkyl; with the condition that when R_2 is benzyl, phenethyl or α,α-dimethylphenethyl, R_1 is hydrogen; and the optically active isomers, and the pharmaceutically acceptable acid addition and metal salts thereof.

2. A method for increasing the growth rate and the lean meat to fat ratio of warm-blooded animals comprising administering either orally or parenterally to animals a growth-promoting and lean-meat-enhancing amount of a compound having the formula:



wherein R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, C_1–C_4 alkyl, benzyl, phenethyl or α,α-dimethylphenethyl; R_3 is OH, OR_5 or SR_6; R_4 is C_1–C_4 alkyl; R_5 is C_1–C_6 alkyl, benzyl, phenyl or allyl; R_6 is hydrogen, C_1–C_6 alkyl, benzyl, phenyl or allyl; with the proviso that when R_2 is benzyl, phenethyl, or α,α-dimethylphenethyl, R_1 is hydrogen; and the optically active isomers, and the pharmaceutically acceptable acid addition and metal salts thereof.

4,404,225

THIOUREA DERIVATIVES HAVING PESTICIDAL ACTIVITY

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

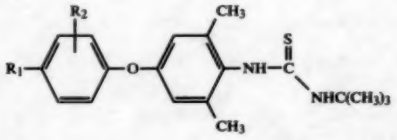
Continuation of Ser. No. 164,375, Jun. 30, 1980, abandoned. This application Jun. 5, 1981, Ser. No. 270,755

Claims priority, application Switzerland, Jul. 3, 1979, 6197/79; Jun. 11, 1980, 4490/80

Int. Cl.³ C07C *157/09;* **A01N** *47/30*

U.S. Cl. 424—322 **18 Claims**

1. A compound of the formula

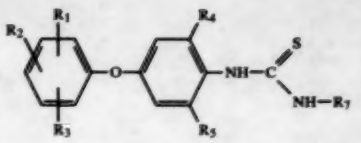


wherein

R_1 is hydrogen, methyl, methoxy, trifluoromethyl, chlorine, bromine or nitro, and

R_2 is hydrogen, chlorine, trifluoromethyl or nitro.

12. A method for combatting insects and acarids which comprises applying thereto an insecticidally or acaricidally effective amount of a compound of the formula



wherein

each of R_1, R_2 and R_3 is hydrogen, C_1–C_4 alkyl, methoxy, halogen, trifluoromethyl or nitro,

R_4 is hydrogen or methyl,

R_5 is C_1–C_3 alkyl, and

R_7 is C_1–C_{12} alkyl, C_3–C_5 alkenyl or C_3–C_8 cycloalkyl.

4,404,226

USE OF GUANFACINE IN TREATING SCHIZOPHRENIA

Milan Matejcek, Riehen; Carl Theohar, Basel, and Horst Kleinlogel, Hinterkappelen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

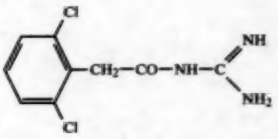
Filed Jul. 6, 1982, Ser. No. 395,724

Claims priority, application Switzerland, Jul. 9, 1981, 4512/81

Int. Cl.³ A61K *31/155*

U.S. Cl. 424—326 **3 Claims**

1. A method of treating schizophrenia which comprises administering to a subject in need of such treatment a therapeutically effective amount of Guanfacine of formula I:



I

in free base form or in pharmaceutically acceptable acid addition salt form.

4,404,227

BREAD MIX AND PROCESS

Seymour Pomper, Stamford, and Glenn D. La Baw, Greenwich, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 1, 1981, Ser. No. 268,701

Int. Cl.³ A21D *8/00, 10/00*

U.S. Cl. 426—19 **28 Claims**

1. A process for preparing bread which comprises: mixing water with a dry bread mix to form a dough, the dry mix comprising flour, from 1.5 to 2.5% quick-leavening active dry yeast, from 2 to 10% of a balanced chemical leavening system, and from 0.1 to 0.75% of a dough conditioner selected from the group consisting of calcium stearoyl-2-lactylate, sodium stearoyl-2-lactylate, and mixtures of these, all percentages based on the weight of the dry mix; shaping the dough into units for baking; proofing the shaped units for from about 15 to about 30 minutes; and baking.

4,404,228

LIPID AND PROTEIN CONTAINING MATERIAL IN PARTICULATE FORM AND PROCESS THEREFOR

Aloysius B. M. Cloosterman, Emmerich, Fed. Rep. of Germany, and Simon V. Kranenburg, Ijssel, Netherlands, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Jan. 20, 1982, Ser. No. 341,184

Claims priority, application United Kingdom, Jan. 21, 1981, 8101790

Int. Cl.³ A23D 5/00; A23J 7/02

U.S. Cl. 426—98 14 Claims

1. A process for preparing a free-flowing and non-caking lipid- and protein-containing material in particulate form comprising 95 to 35 wt.% of vegetable proteinaceous material, said proteinaceous material consisting of a porous particulate substance which comprises at least 30 wt.% of substantially water-insoluble protein and the balance of a lipid phase and 1 to 10 wt.% of water, said lipid phase comprising 80 to 99 wt.% of fats and/or oils and 1 to 20 wt.% of lecithin, said lipid phase being contained within interstitial spaces of individual particles of said porous substance, said process comprising preparing a suspension of either said proteinaceous matter or said lipid phase in an aqueous medium at elevated temperature, including therein the other component while ensuring that said lipid phase is molten, homogenizing the suspension obtained and drying the homogenized material.

4,404,229

METHOD FOR THE PRODUCTION OF MOLDED MEAT OR MEAT-LIKE PRODUCTS

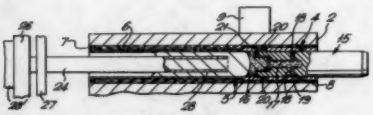
Timothy J. M. Treharne, East Grinstead, England, assignor to Tivet Developments Ltd., East Grinstead, England

Division of Ser. No. 941,872, Sep. 13, 1978, Pat. No. 4,280,803. This application Mar. 9, 1981, Ser. No. 241,818

Claims priority, application United Kingdom, Sep. 14, 1977, 38395/77

Int. Cl.³ A22C 11/00; A23B 4/12; A23L 1/31

U.S. Cl. 426—513 13 Claims



1. A method of producing a skinless molded meat or meat-like product of predetermined shape having a fluid treated surface, said method comprising:

(a) providing a rigid mold cavity having side walls and oppositely disposed end walls defining a predetermined shape and having said side walls permeable over a major portion thereof,

(b) introducing a product into the mold cavity, which product conforms to the predetermined shape of the mold cavity, and

(c) introducing a fluid through said permeable side walls for treating at least a major portion of the surface of the product to form a coagulated surface layer on said product at least while in said predetermined shape.

4,404,230

4-HYDROXY-1,2-BENZISOTHIAZOL-3(2H)-ONE-1,1-DIOXIDES AND SALTS THEREOF

Günter Trummlitz, Warthausen; Wolfgang Eberlein, Biberach; Wolfhard Engel, Biberach, and Günther Schmidt, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

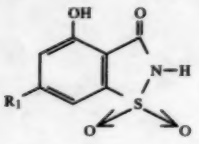
Filed Apr. 15, 1981, Ser. No. 254,546

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1980, 3015113

Int. Cl.³ C07D 275/06; A23L 1/236

U.S. Cl. 426—548 5 Claims

1. A compound of the formula



wherein R_1 is hydrogen or hydroxyl, or a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

5. The method of sweetening foods or beverages, which comprises adding thereto an effective sweetening amount of a compound of claim 1.

4,404,231

PROCESS FOR PRODUCING A FAT-CONTINUOUS EMULSION SPREAD WITH IMPROVED PERCEIVED TASTE SENSATIONS OF WATER SOLUBLE FLAVORANTS

Cornelis den Hollander, Rotterdam, and Berend J. Arends, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,027

Claims priority, application United Kingdom, Nov. 27, 1980, 8038026

Int. Cl.³ A23D 3/02, 5/02

U.S. Cl. 426—602 16 Claims

1. A process for producing an edible water-in-oil emulsion spread which on consumption gives an improved perceived impression of water soluble flavorants, comprising (a) emulsifying an aqueous phase in at least a partially melted fatty phase containing a plastic fat blend to obtain a W/O emulsion; (b) subjecting the W/O emulsion thus obtained to working and cooling to at least partly crystallize the fat; (c) incorporating in the partly crystallized W/O emulsion a water-soluble flavouring ingredient in the form of a dispersion in an oil which is pourable or liquid at ambient temperature, and further cooling and working to obtain a spread.

4,404,232

METHOD OF DEPOSITING METAL COATING LAYERS CONTAINING PARTICLES ON THE WALLS OF CHILL MOULDS

Egon Evertz, Vorlander Strasse 23, 5650 Solingen, Fed. Rep. of Germany

Filed Oct. 6, 1981, Ser. No. 309,170

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038289

Int. Cl.³ C23C 3/02

U.S. Cl. 427—8 7 Claims

1. A method of depositing a metal coating on a wall of a chill mould for continuous casting, comprising the steps of: arranging said wall in approximately an upright position in a bath containing a solution of at least one nickel salt and particles of a hard material suspended in said solution, determining the critical deposition temperature range of said bath defined by an upper temperature limit and a lower temperature limit, and

depositing a metallic layer containing nickel on said wall while maintaining said wall at a temperature in the vicinity of one of said upper and lower temperature limits and maintaining said solution at a temperature in the vicinity of the other of said upper and lower temperature limits, the temperature difference between said wall and said solution being within said critical deposition temperature range.

4,404,233

ION IMPLANTING METHOD

Tadashi Ikeda; Norikazu Tsumita, both of Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 13, 1981, Ser. No. 224,743
Claims priority, application Japan, Jan. 23, 1980, 55-5754
Int. Cl.³ B05D 3/06
U.S. Cl. 427—35 6 Claims

1. An ion implanting method of forming an ion-implanted region in a magnetic film to be ion-implanted by irradiating a desired portion of said film with an ion beam directed at an angle to said film,

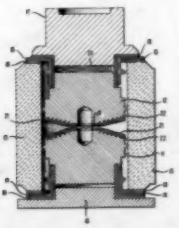
wherein the improvement resides in that the irradiation of said ion beam is performed in a manner to vary the angle between said ion beam and the desired portion of said film whereby the peak of the ion concentration is flattened.

4,404,234

ELECTRODE COATING PROCESS

Paul Zuk, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1981, Ser. No. 333,976
Int. Cl.³ B05D 5/12
U.S. Cl. 427—37 9 Claims



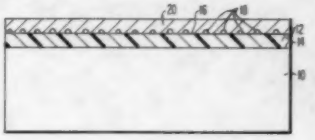
1. A method of fabricating a sealed gas surge limiter having two electrodes (11 and 12) and a spark gap (19) therebetween comprising the steps of depositing a coating (21) on a portion of the electrodes and thereafter applying a pulsed signal of controlled amplitude and pulse duration of the electrodes which causes conduction in the arc mode for several periods of time of less than 400 μsec so that for each of said periods a limited portion of the coating bonds with one of the electrodes.

4,404,235

METHOD FOR IMPROVING ADHESION OF METAL FILM ON A DIELECTRIC SURFACE

Ming L. Tarng, Mercerville, N.J., and Walter A. Hicinbothem, Jr., Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,415
Int. Cl.³ H01L 21/285
U.S. Cl. 427—89 8 Claims



1. A method for depositing a metal film on a dielectric surface, comprising the steps of:

exposing the dielectric surface to gaseous WF_6 and H_2, at a temperature between approximately 500° C. and 650° C., so as to form an adherence layer without etching the dielectric surface, said adherence layer comprising a plurality of discontinuous tungsten islands on the dielectric surface; and thereafter

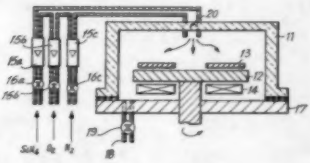
introducing said metal, in gaseous form, to said surface.

4,404,236

HIGH PRESSURE CHEMICAL VAPOR DEPOSITION

Shoichi Komatsu, and Seiichi Iwamatsu, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,305
Claims priority, application Japan, Oct. 24, 1980, 55-149206
Int. Cl.³ H01L 21/316, 21/318
U.S. Cl. 427—94 13 Claims



1. In a process of chemical vapor deposition wherein a thin SiO_2 film is formed on a substrate by chemical reaction of a vapor, the improvement which comprises carrying out the chemical vapor deposition at a pressure greater than at least 2 atmospheres.

4,404,237

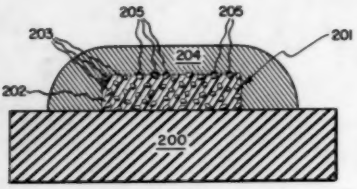
FABRICATION OF ELECTRICAL CONDUCTOR BY REPLACEMENT OF METALLIC POWDER IN POLYMER WITH MORE NOBLE METAL

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,342
Int. Cl.³ H05K 3/12, 3/18
U.S. Cl. 427—96 97 Claims

1. A method for forming an electrical conductor in desired areas of a substrate, which comprises the steps of: applying a desired design to said substrate with an ink composition comprising a finely divided metallic powder having at least a first metal therein and a curable polymer; at least partially curing said curable polymer to cause volumetric shrinkage thereof; adjusting the amount of the finely divided powder to be about

60-80% by volume of said ink composition after the ink is at least partially cured; and contacting the at least partially cured ink composition of the desired design with a metal salt solution of a second metal in which the second metal cation is more noble that at least the first metal of finely divided powder and the anion of said metal salt forms soluble salts with both said



cation and at least the first metal of said finely divided powder, to cause said second metal of said metal salt solution to plate out as a contiguous layer on the surface of said ink composition and with a volume of said second metal on said surface greater than the volume of the metal of said powder removed from said surface.

4,404,238

PRECIPITATED ALUMINA FOR USE IN MAGNETIC RECORDING DISC MEDIA

Chandler M. Baldwin, Santa Clara, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Apr. 16, 1981, Ser. No. 254,935
Int. Cl.³ H01F *10/02*
U.S. Cl. 427—128 **7 Claims**

1. A method of manufacturing a magnetic recording medium comprising magnetic particles and alumina particles dispersed in a binder as a unitary coating upon a non-magnetic substrate wherein each of the alumina particles are disposed in said binder and are substantially equal to the thickness of the medium wherein said alumina particles are produced by first forming an aluminum hydrate from an alumina hydrate gel according to the following equation:

$$Al_2O_3.nH_2O \rightarrow Al_2O_3.3H_2O + (n-3)H_2O$$

wherein $n>3$
and heating the aluminum hydrate above approximately 800° C. to form alumina according to the following equation:

$$Al_2O_3.3H_2O \rightarrow Al_2O_3 + 3H_2O$$

4,404,239

TREATMENT OF WOOD WITH WATER REPELLENT COMPOSITIONS

John F. Grunewalder, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 224,429, Jan. 12, 1981, Pat. No. 4,360,385. This application Aug. 2, 1982, Ser. No. 404,243
Int. Cl.³ B05D *3/02*; C09D *5/14*; C09K *3/18*
U.S. Cl. 427—393 **16 Claims**

1. A method of treating wood so as to provide the wood with water-repellency, comprising the steps of:

(a) applying to wood a water-repellent composition, said composition consisting essentially of;

(i) from about 1% to about 50% of an alpha olefin having from 20 to 24 carbon atoms, a narrow cut alpha olefin blend, a narrow cut paraffin blend, or a mixture thereof, wherein said olefin blend and paraffin blend consists essentially of a mixture of compounds of which at least about 50% have from 20 carbon atoms to 24 carbon atoms;

(ii) from about 0% to about 6% of a wood preservative;

(iii) from about 0% to about 20% of an alkyd resin;

(iv) from about 0% to about 5% of an organic ionizable compound; and

(v) from about 45% to about 98% of an organic solvent, and

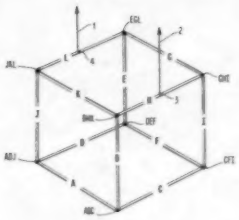
(b) drying the wood of step (a) so as to produce the treated wood.

4,404,240

MOBILE

Michael A. Varela, 2668 Ringneck Rd., Audubon, Pa. 19401

Filed Oct. 13, 1980, Ser. No. 310,638
Int. Cl.³ A63H *33/40*; G09B *23/04*; G09F *21/00*
U.S. Cl. 428—8 **6 Claims**



1. In a mobile:

twelve elongated members positioned with respect to one another to create the appearance of at least one hexahedron shape;

eight flexible joint means each respectively joining three members together to form four corners of said hexahedron shape and providing for the members to remain attached to one another and to pivot relative to each other;

support means;

connection means respectively connecting the support means to an opposite pair of members for suspending the mobile and providing for relative motion between the support means and the members connected thereto; and

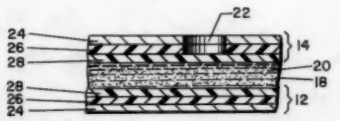
the elongated members, the flexible joint means, and the connection means providing for the mobile to assume a balanced, static condition whereby the members create the appearance of an hexahedron of one shape and also for the members to move relative to each other upon the application of forces thereto whereby to create the appearance of an hexahedron of a shape different from said one shape.

4,404,241

MICROWAVE PACKAGE WITH VENT

Robert L. Mueller, and Jerome A. Cherney, both of Appleton, Wis., assignors to James River-Dixie/Northern, Inc., S. Norwalk, Conn.

Filed Dec. 19, 1979, Ser. No. 105,413
Int. Cl.³ B65B *25/22*; B65D *51/16, 65/10, 65/38*
U.S. Cl. 428—35 **14 Claims**



1. A multilayered sheet material, adapted for use in a package or as a component thereof for venting vapor generated by

a material contained therein when subjected to cooking temperatures, which comprises: a substrate of heat-resistant material, capable of maintaining dimensional stability, when exposed to cooking temperatures and operations, and not interfering with said cooking operation, said substrate having at least one aperture formed therein that extends from its top surface to its bottom surface; and a continuous sealing layer of an extrudable hot melt material having a melt flow index of about 2 to 20 grams/minute at 125° C. bonded to a surface of said substrate and extending over the interstice defining said aperture said sealing layer extending over said interstice being operable to soften and flow when exposed to said cooking temperatures to vent the vapor generated by cooking.

7. A method for producing a multilayered sheet material comprising at least one sealed aperture, which comprises the steps of:

(a) providing a substrate comprising a first layer of a material capable of maintaining dimensional stability when exposed to cooking temperatures and operations, and not interfering with said cooking operations;

(b) forming apertures in said substrate that extend through the substrate;

(c) passing the apertured substrate into a nip formed between a chill roll and a pressure roll while simultaneously passing a hot melt extrusion of an ethylene-vinyl acetate-wax material having a melt flow index of about 3 to 20 grams/minute at 125° C. into the nip between the substrate and the pressure roll, the extruded material being applied to said substrate material and passing through said apertures to release material on the underlying pressure, whereby when the rolls are pressed together, the extruded material is released from the pressure roll to bond as a layer to a surface of said substrate and extend over and seal the interstices defining the apertures, the sealing layer so formed being operable to soften and flow when exposed to said cooking temperatures to vent the vapor generated by cooking.

11. A package for containing vapor-generating material and adapted to vent such vapor while maintaining said package in a substantially uniform flat condition which comprises: a bottom portion bonded along its peripheral edges to a top portion and having a cavity therebetween for containing a vapor-generating material, said top portion comprising a multilayered sheet material formed from a first layer capable of maintaining dimensional stability when exposed to elevated temperatures bonded to a second layer of polyethylene, said polyethylene bonded substrate having at least one aperture formed therein that extends from its top surface to its bottom surface and a continuous layer of an extrudable hot melt material having a melt flow index of about 3 to 20 grams/minute at 125° C. bonded to said polyethylene surface of the substrate and sealing the interstice defining said aperture, said hot melt material sealing the aperture conveying moisture barrier properties to the package at other than cooking temperatures and softening when exposed to cooking temperatures to soften and flow to vent vapor generated by cooking prior to distortion of the package.

4,404,242

FILM LAMINATE FOOD WRAP AND FOOD POUCH THEREFROM

Joann H. Squier, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,748

Int. Cl.³ B32B 27/08

U.S. Cl. 428—35 **15 Claims**

1. A flexible film laminate comprising

(a) an oriented polyacrylonitrile film containing an adhesion promoting proportion of a polyalkylene glycol ether having the formula:

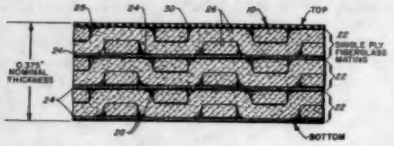
$$HO\left(CH_2CH-O\right)_nH$$
$$\quad\quad\quad

4,404,244

SYSTEM FOR RAPID REPAIR OF DAMAGED AIRFIELD RUNWAYS

Preston S. Springston, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 27, 1982, Ser. No. 437,092
Int. Cl.³ B32B 5/12
U.S. Cl. 428—109 20 Claims



13. A low-profile fiberglass reinforced polyester laminate membrane trafficable cover for use over compacted backfilled bomb craters to rapidly repair crater damage airfield pavements, comprising:

a. a plurality of fiberglass mats, each fiberglass mat consisting of a layer of chopped fiberglass strands chemically bonded to a layer of woven fiberglass roving;

b. said fiberglass mats being laid in alternating directions to adjacent mats;

c. said plurality of fiberglass mats being saturated (without excess) with a polyester resin to fill all voids between the glass fibers and layers, and the laminate cured;

d. a plurality of anchoring holes provided around the perimeter of said cover;

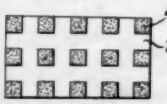
e. a low profile bushing and anchor bolt provided for each of said anchoring holes for fastening said trafficable cover to corresponding anchor bolt holes in airfield pavement about the perimeter of a crater being repaired.

4,404,245

PROTECTIVE SHEET FOR CASSETTE HOLDING MAGNETIC RECORDING TAPE

Toshihiko Ishida, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 14, 1981, Ser. No. 263,599
Claims priority, application Japan, Jun. 2, 1980, 55-75181[U]
Int. Cl.³ B32B 3/00, 27/14; G11B 5/78
U.S. Cl. 428—206 6 Claims



1. A protective sheet for a cassette holding a magnetic recording tape which comprises a transparent base which is coated with a hardened surface layer formed by bonded hard fine particles made of a mixture of Al_2O_3, TiO_2 and SiO_2 with a binder wherein a ratio of said hard fine particles to said binder is in a range of about ¼ to about 1/10 by weight.

4,404,246

STORABLE, CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE TAPE

Robert R. Charbonneau, Lake Elmo, and Gaylord L. Groff, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 22, 1982, Ser. No. 421,151
Int. Cl.³ B05D 5/10, 3/06; C09J 7/02
U.S. Cl. 428—212 7 Claims

1. A tape comprising a carrier web and a pressure-sensitive adhesive layer comprising a copolymer of

(a) acrylic acid ester of nontertiary alcohol, the molecules of which have from 1–14 carbon atoms, at least a major proportion of said molecules having a carbon-to-carbon chain of 4–12 carbon atoms terminating at the hydroxyl oxygen atom, said chain containing at least about one-half the total number of carbon atoms in the molecule, said acrylic acid ester being per se polymerizable to a sticky, stretchable elastic adhesive polymer mass, and

(b) at least one copolymerizable monoethylenic monomer selected from the group consisting of acrylic acid, methacrylic acid and itaconic acid,

wherein the improvement comprises:

the copolymerizable monomer (b) comprises from 10 to 25 percent by weight of said monomers (a) and (b) and

the adhesive layer includes in an amount within the range of about 0.1 to 0.8 percent by weight of the copolymer, a lower-alkoxylated amino formaldehyde condensate having C_{1-4} alkyl groups, said copolymer being substantially uncrosslinked and hence retaining some tackiness until being heated.

3. A tape as defined in claim 1 wherein the carrier web has a low-adhesion surface from which the adhesive layer can be easily peeled off.

4. A tape as defined in claim 3 wherein the carrier has low-adhesion surfaces on both faces, and the tape is wound upon itself in roll form.

5. A tape as defined in claim 4 wherein the two low-adhesion surfaces are different so that the adhesive layer preferentially adheres to one surface.

4,404,247

PROTECTIVE COVERING FOR MAGNETIC RECORDING MEDIUM

Mario Dominguez-Burguette, Woodbury, Minn., and George D. Foss, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 2, 1982, Ser. No. 394,531
Int. Cl.³ G11B 5/82; B32B 27/30
U.S. Cl. 428—213 21 Claims

1. A magnetic recording medium having a magnetizable coating, the face of which is covered by a covering comprising

an inner layer of an insoluble polymer made from 80 to 95 parts by weight of a film-forming aromatic or heterocyclic polymerizable monomer having a plurality of polymerizable, ethylenically unsaturated groups and correspondingly 20 to 5 parts by weight of vinyl aromatic comonomer, and

an outer layer of insoluble polymer made from monomer having a perfluoropolyether segment which comprises a plurality of $—C_aF_{2a}O—$ repeating units, were subscript a is independently in each such units an integer from 1 to 4,

the thickness of said covering not exceeding 200 nm.

12. A magnetic recording medium having a metallic thin-film coating covered with an adherent, cohesive, protective covering having low surface energy, said covering comprising

an inner layer of an insoluble polymer made of 80 to 95 parts by weight 1,3-bis 3-[2,2,2-(tri- acryloyloxymethyl)ethoxy]-2-hydroxypropyl -5,5-dimethyl-2,4-imidazolidinedione or the dimethacrylate of hydroxypropoxylated bisphenol A and 20 to 5 partsby weight alpha-methyl styrene, and

an outer layer of an insoluble polymer made from monomer having a perfluoropolyether segment which is

$$-CF_2O(CH_2CF_2O)_m(CF_2O)_nCF_2-$$

wherein m and n denote randmonly distributed repeating units, the ration m/n is in the range of 0.2/1 to 5/1, the number average molecular weight of said segment is in the range of 800 to 10,000, and at least 75 weight percent of said outer layer is said segments,

the weight of said inner layer being from 1 to 40 times that of said outer layer, and the thickness of said covering being in the range of 10 to 100 nm.

13. Method of making a magnetic recording medium with a covering protecting the face of the magnetizable coating of said medium, comprising the steps of

(a) coating onto said face a first dilute solution of from 80 to 95 parts of a film-forming aromatic or heterocyclic polymerizable monomer having a plurality of polymerizable ethylenically unsaturated groups, and correspondingly from 20 to 5 parts by weight of vinyl aromatic monomer to provide an inner coating,

(b) coating over the inner coating a second dilute solution of polymerizable monomer having a perfluoropolyether segment comprising a plurality of $-C_aF_{2a}O-$ repeating units, where subscript a in each such unit independently is an integer from 1 to 4, to provide an outer coating,

(c) drying said coatings and polymerizing said monomers, the thickness of the resultant composite covering not exceeding 200 nm.

4,404,248

CLEAR COAT/COLOR COAT FINISH FROM A HIGH SOLIDS COATING COMPOSITION OF A BLEND OF A LOW MOLECULAR WEIGHT ACRYLIC POLYMER AND A MEDIUM MOLECULAR WEIGHT ACRYLIC POLYMER AND AN ALKYLATED MELAMINE CROSS-LINKING AGENT

Harry J. Spinelli, Wilmington, Del., and Alan L. Thompson, Rochester, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 144,297, Apr. 28, 1980, Pat. No. 4,330,458. This application Dec. 28, 1981, Ser. No. 334,892

Int. Cl.³ B32B 7/02

U.S. Cl. 428—215 **10 Claims**

1. A substrate having a finish of a clear coat top layer in firm adherence to a color coat layer in adherence to said substrate; wherein the clear coat consists essentially of a transparent film forming binder and the color coat consists essentially of a film forming binder and pigments in a pigment to binder weight ratio of about 1/100 to 150/100; wherein the color coat and the clear coat being from a high solids coating composition comprising at least 50% by weight of a binder of film-forming constituents and up to 50% by weight of a nonaqueous liquid carrier; in which the film-forming constituents consist essentially of

(A) about 5–45% by weight of a medium molecular weight acrylic polymer having a number average molecular weight, determined by gel permeation chromatography, of about 5,000–20,000, a hydroxyl content of about 2–10% by weight, a glass transition temperature of about −20° C. to +25° C.;

(B) about 10–50% by weight of a low molecular weight acrylic polymer having a number average molecular weight determined as above of about 500–7,500, a hydroxyl content of about 2–10% by weight, a glass transition temperature of about −20° C. to +25° C.;

wherein the acrylic polymers being the same or different consist essentially of

15–82% by weight of methyl methacrylate, 2–50% by weight of an alkyl methacrylate or an alkyl acrylate each having 2–18 carbon atoms in the alkyl group and 16–35% by weight of a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate each having 2–4 carbon atoms in the alkyl group and

wherein the difference in molecular weight between the acrylic polymers is at least 3000; and

(C) about 25–45% by weight of an alkylated melamine formaldehyde cross-linking agent having 1–4 carbon atoms in the alkyl group; and in addition to the above film-forming constituents contains about 0.1–2.0% by weight of an acid catalyst.

4,404,249

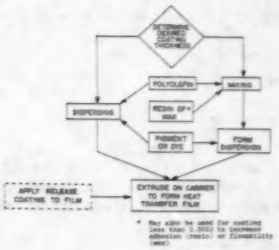
THERMAL IMPRINTING OF SUBSTRATES

Edward S. Margerum, Salem, and Norman A. Hiatt, Framingham, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Oct. 6, 1980, Ser. No. 194,694

Int. Cl.³ B41M 5/26

U.S. Cl. 428—216 **21 Claims**



1. A heat transfer film comprising

(a) a plastic film carrier;

(b) a transfer layer consisting of a uniform blend of a pigmented polyolefin and a rosin ester applied as a single uniform hot melt coating to said carrier.

4,404,250

FIRE-RETARDANT HIGH PRESSURE CONSOLIDATED ARTICLES CONTAINING AN AIR-LAID WEB AND METHOD OF PRODUCING SAME

Theodore R. Clarke, Cincinnati, Ohio, assignor to Formica Corporation, Wayne, N.J.

Filed Sep. 23, 1982, Ser. No. 422,041

Int. Cl.³ D04H 1/58

U.S. Cl. 428—220 **12 Claims**

1. A fire-retardant heat and pressure consolidated article comprising,

(a) a monostichous layer of randomly oriented, substantially non-hydrogen bonded, cellulosic fibers from about 0.5 mm to 2.5 mm in average length, said layer being from about 0.25 mm to 2.25 mm thick and containing from about 20% to 35%, by weight, based on the total weight of fiber, resin and flame retardant in (a), of a thermoset resin and a flame-retarding amount (a) of boric acid or ammonium pentaborate.

4,404,251

COPYING SYSTEMS, A PROCESS FOR THEIR PRODUCTION, AND SUITABLE PRINTING INKS FOR BOTH OFFSET AND BOOK PRINTING

Gert Jabs, Odenthal; Manfred Dahm, Levenkusen; Artur Haus, Overath; Ulrich Nehen, Leverkusen; Klaus Rath, Leverkusen, and Norbert Weimann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 244,616, Mar. 17, 1981, abandoned. This application Feb. 24, 1982, Ser. No. 352,038

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011708; Mar. 26, 1980, 3011709; Feb. 4, 1981, 3103816

Int. Cl.[3] B41M *3/12;* B41L *1/20*

U.S. Cl. 428—320.6 16 Claims

1. A process for producing a donor sheet for a pressure-sensitive carbonless copying system by applying printing ink containing a binder on to a paper substrate and then hardening the same, said process comprising applying a printing ink which comprises microcapsules containing a dye precursor, spacers having a grain size from 1.5 to 10 times the diameter of the microcapsules and a binder comprising an air-drying alkyd resin, a vegetable oil or a mixture thereof to at least part of a surface of a paper substrate by a wet or a dry offset or book printing technique.

8. A printing ink which comprises microcapsules containing a dye precursor, spacers having a grain size from 1.5 to 10 times the diameter of the microcapsules and a binder comprising an air-drying alkyd resin, vegetable oil or a mixture thereof.

4,404,252

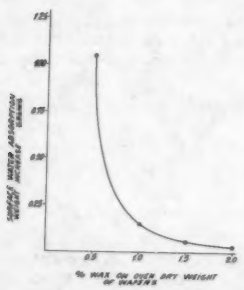
SURFACE STABILIZED WAFERBOARD

Bernard H. Hetzler, and Hugh V. Martin, both of British Columbia, Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

Filed Sep. 16, 1981, Ser. No. 302,763

Int. Cl.[3] B32B *5/16*

U.S. Cl. 428—326 35 Claims



1. Waferboard having at least one surface rendered water resistant and stabilized against wafer loss, formed of wood wafers bonded together in a hot press with an adhesive resin and wax, and having a layer of porous paper bonded in the hot press to at least one surface of the waferboard, said paper retaining its porosity after said bonding in the hot press.

20. In a process for manufacturing waferboard wherein wood wafers are bonded together in a hot press with an adhesive resin and wax, the improvement of imparting water resistance and stabilizing at least one surface of the waferboard against wafer loss, comprising bonding a layer of porous paper to at least one surface of the waferboard while to wood wafers are being bonded together with the hot press, said paper remaining porous after said bonding.

4,404,253

MAGNETIC RECORDING MEDIUM

Robert Kohler, Wessling; Karlchristian Schilffarth, Sauerlach; Heinrich Kober, Hohenschaeftlarn, and Burkhard Nippe, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 137,745, Apr. 7, 1980, abandoned. This application Feb. 25, 1982, Ser. No. 352,208

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914659

Int. Cl.[3] H01F *10/02*

U.S. Cl. 428—327 3 Claims

1. A magnetic recording medium comprised of a flexible support and at least one magnetic layer on said support comprising a water dispersible binder and magnetic pigments wherein the improvement comprises the magnetic layer includes a binder comprised of anionic polyurethane ionomers particles containing from 0.02 to 13% by weight of SO_3^- groups, being dispersed in water with dispersing agents, and said magnetic pigments and said polyurethane ionomer particles having a particle size of 20 nm to 400 nm, the volumetric ratio of magnetic pigment to polyurethane, based on the solids content, being in the range of 0.7:1 to 1.4:1.

4,404,254

PRODUCTION OF LAMELLAR IRON OXIDE PIGMENTS

Gerhard Franz, and Franz Hund, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 112,383, Jan. 15, 1980, abandoned. This application Jul. 7, 1981, Ser. No. 281,134

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1979, 2904491

Int. Cl.[3] C01G *49/02;* C04B *35/26;* C01G *49/08*

U.S. Cl. 428—329 16 Claims

1. Synthetic, hexagonal, lamellar iron oxide particles substantially homogeneously about 0.1 to 12% by weight of at least one oxide of an element of the IVth, Vth or VIth Main and Secondary Groups and of the IInd Secondary Group of the Periodic System of elements.

15. Iron oxide particles according to claim 1 present as a corrosion-inhibiting or decorative colored pigment in a synthetic resin, plastic, glaze or enamel.

16. A magnetic recording support, magneto-optical display or storage device including a ferrite with the crystal structure of spinel or barium hexaferrite and made from iron oxide particles according to claim 1.

4,404,255

COLLOIDAL COATING FOR SMALL THREE DIMENSIONAL ARTICLES, AND PARTICULARLY FOR FUSION TARGETS HAVING GLASS SHELLS

Dennis G. Peiffer, East Brunswick, and Harry W. Deckman, Fanwood, both of N.J., assignors to The University of Rochester, Rochester, N.Y.

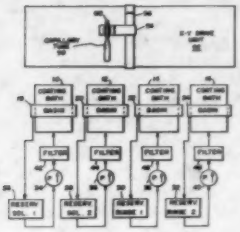
Division of Ser. No. 155,266, Jun. 2, 1980, Pat. No. 4,315,958. This application Apr. 20, 1981, Ser. No. 255,622

Int. Cl.[3] B32B *5/16*

U.S. Cl. 428—406 5 Claims

1. A three-dimensional glass microballoon of maximum dimensions from about 20 to 500 microns coated on all surfaces thereof and of material having an inherent surface charge of

one polarity, a multitude of alternate monolayers of particles of material of positive and negative opposite charge adhered to



said surfaces onto each other, the first of said monolayers being particles of polarity opposite to said one polarity.

4,404,256

SURFACE FLUORINATED POLYMERS

Madhu Anand, Cambridge; Raymond F. Baddour, Belmont, and Robert E. Cohen, Jamaica Plain, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 134,182, Mar. 26, 1980, Pat. No. 4,264,750, which is a continuation-in-part of Ser. No. 62,895, Aug. 1, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,488

Int. Cl.³ C08F *8/20, 8/22*

U.S. Cl. 428—409 **11 Claims**

1. A fluorinated polymeric article having a substantially completely fluorinated surface of low surface energy and substantially free of oxygen and having a thickness up to about 200 Angstroms, the remainder of said article comprising a non-fluorinated polymer, said fluorinated surface being formed by fluorinating the surface of said polymeric article comprising said non-fluorinated polymer.

4,404,257

COATED AND ULTRAVIOLET RADIATION STABILIZED POLYCARBONATE ARTICLE

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1981, Ser. No. 253,364

Int. Cl.³ B32B *27/36*

U.S. Cl. 428—412 **19 Claims**

1. An improved coated polycarbonate resin article exhibiting improved resistance to degradation by ultraviolet radiation comprising a polycarbonate resin substrate having durably adhered to at least one surface thereof a coating comprised of (i) an adhesion promoting primer layer containing a thermoplastic acrylic polymer disposed on said surface, and (ii) adherently disposed on said primer layer a top coat layer containing a colloidal silica filled thermoset organopolysiloxane; the improvement consisting essentially of the surface layers of said surface of the substrate on which said coating is disposed being impregnated with at least one ultraviolet radiation absorbing compound.

4,404,258

COLOR STABILIZED WATER-DISPERSED POLYURETHANE COATING ON VINYL SURFACES

Peter Loewrigkeit, Wyckoff, and Shmuel Dabi, Highland Park, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 191,729, Sep. 29, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,330

Claims priority, application Canada, Jul. 21, 1981, 383058

Int. Cl.³ B32B *27/40*; B05D *3/02*

U.S. Cl. 428—424.6 **8 Claims**

1. A color stabilized polyurethane coated polyvinyl chloride surface, said polyurethane and said polyvinyl chloride each of which is substantially color stable at about over 100° C. but which become discolored at about 100° C. when combined, comprising:

a said polyvinyl chloride or copolymer surface; and

a coating cured on said surface, said coating comprising a water-dispersed latex of said polyurethane

said dispersed polyurethane being treated with a compound selected from the group consisting essentially of a mono-acid halide, mono-acid anhydride and carbethoxy cyclic imide.

4,404,259

MAGNETIC RECORDING MEDIUM

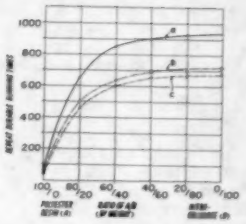
Akihiko Hosaka; Yukihiro Isobe, and Kiyotaka Okuyama, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,611

Claims priority, application Japan, Oct. 21, 1980, 55-146341

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—425.9 **10 Claims**



1. A magnetic recording medium, comprising: a magnetic layer comprising a magnetic powder and a binder coated on a substrate, said binder consisting essentially of 40–80 wt % of a polyester resin, 60–20 wt % of an isopropyl alcohol or dibutyl phthalate free-nitrocellulose containing vinyl chloride-vinyl acetate copolymer as a protective component for the nitrocellulose and a polyisocyanate.

4,404,260

MAGNETIC RECORDING MEDIUM AND METHOD OF MANUFACTURE

Fujio Shibata, Komoro, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1982, Ser. No. 401,405

Claims priority, application Japan, Jul. 25, 1981, 56-116832

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—458 **10 Claims**

1. A magnetic recording medium having formed on the surface of a non-magnetic substrate, a layer comprising a binder vehicle having dispersed therein magnetic particles which are surface coated with a polyaminoamide phosphate.

4,404,261

METHOD OF MOLDING MULTI-PLY POLYMERIC COMPOSITES INCLUDING SIMULTANEOUS CURING OF PLURAL LAYERS HAVING DIFFERENT CATALYST POLYMERIZATION INITIATION TEMPERATURES AND PRODUCT THEREOF

John L. Canning, Newark, and John F. Kay, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 13, 1981, Ser. No. 310,555

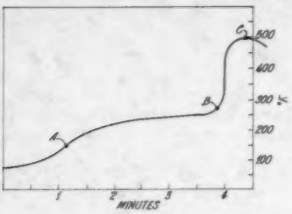
Int. Cl.³ B29C *3/02*; B29J *1/02*

U.S. Cl. 428—480 **15 Claims**

1. A method for molding a plurality of polymeric plies to form a composite article, comprising:

(a) disposing a plurality of compatible polymeric plies in a mold in contact relationship, at least same of said plies

having catalyst systems with polymerization initiating temperatures different from polymerization initiation temperatures of catalyst systems of others of said plies, said initiation temperatures being such that when all of said plies are suitably heated within said mold, all of the catalyst systems reach their several different initiation temperatures substantially simultaneously; and



(b) molding said plurality of plies under pressure and heating for a period and in a manner such as to raise said polymeric plies and said catalyst systems to their several different polymerization initiation temperatures to informly crosslink said polymeric plies and form said polymeric article.

4,404,262

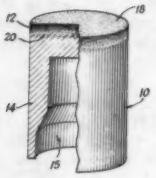
COMPOSITE METALLIC AND REFRACTORY ARTICLE AND METHOD OF MANUFACTURING THE ARTICLE

Thomas Watmough, Flossmoor, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Aug. 3, 1981, Ser. No. 289,586

Int. Cl.³ B22F *3/26*

U.S. Cl. 428—539.5 **1 Claim**



1. A method of manufacturing a composite article comprising a metallic portion and a refractory portion bonded together comprising:

disposing a first refractory member in contact with a molten metal, said refractory member having a predetermined thickness of a first solid refractory material extending from an exposed surface of said refractory member to define a refractory-metal interface within said refractory member, said refractory member including a second, porous refractory material extending from said refractory-metal interface to a metal contacting surface of said refractory member, where said second, porous refractory material has a porosity gradient generally increasing from said refractory-metal interface to said metal contacting surface and where the metal has a coefficient of thermal expansion at least twice the coefficient of thermal expansion of said second refractory material;

securing a second, distinct porous refractory member to said first refractory member, said second refractory member having a greater porosity than said second refractory material of said first refractory member;

applying a force between 140 and 1400 kilograms per square centimeter to said molten metal to cause said molten metal to penetrate through said second more porous refractory member and into said second, porous refractory material of said first refractory member; and

solidifying said molten metal.

4,404,263

LAMINATED BEARING MATERIAL AND PROCESS FOR MAKING THE SAME

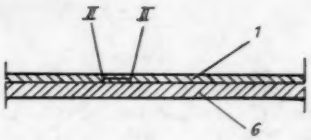
Erich Hodes, Rosbach, and Michael Steeg, Oberolm, both of Fed. Rep. of Germany, assignors to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 102,011, Dec. 10, 1979, abandoned. This application Oct. 16, 1981, Ser. No. 312,110

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853724; Apr. 11, 1979, 2914618; Oct. 5, 1979, 2940376

Int. Cl.³ C23C *15/00*; F16C *33/00*

U.S. Cl. 428—564 **39 Claims**



1. Laminated bearing stock comprising, in combination:

(a) a substrate structure;

(b) a facing layer of material containing a matrix of antifriction substance which is sputtered by electrical discharge from a single, composite metallic target in a gas onto the said substrate structure,

(c) said matrix including particles of oxides of at least one metal,

(d) said particles being disposed in a fine suspension and constituting less than 1% by volume of said matrix substance,

(e) said selected metal and said oxide thereof being such that the volume of the oxide is greater than the volume of the respective metal,

(f) said facing layer also containing particles of at least one plastic substance having anti-friction properties, held in said matrix,

(g) said plastic substance having a dielectric constant of at most 2.6, and,

(h) means effected by said sputtering of the material of the facing layer against said substrate structure, for bonding and cohering the said facing layer thereto.

4,404,264

MULTI-GAUGE STRIP

Robert N. Tatum, Chesterfield, Mo.; Robert W. Hofer, Watertown, Conn., and S. Paul Zarlingo, Granite City, Ill., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 26, 1981, Ser. No. 228,633

Int. Cl.³ H01B *5/14*

U.S. Cl. 428—573 **4 Claims**

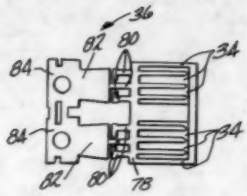
1. A multi-gauge strip useful in making leadframes for electronic devices, comprising:

a first strip of high strength metal suitable for forming electrical connectors having a first thickness and extending longitudinally for a given length;

a second strip of high conductivity metal, with a lower strength and higher conductivity than said first metal, having a second thickness greater than said first thickness, said second strip further being narrower in width than said first strip, and coextending longitudinally with said first strip of metal;

said first and second strips of metal being metallurgically bonded without the use of a welding or brazing material to form said multi-gauge strip;

the multi-gauge strip further having a first portion extending the given length, adapted to dissipate heat from an electronic device mounted thereto, said first portion formed from said first and second strips so as to have a third thickness substantially equal to the sum of the first and second thicknesses;



said multi-gauge strip also having a second portion adapted to form said electrical connectors, said second portion formed from said second strip so as to substantially extend the given length and have a fourth thickness substantially equal to the first thickness.

4,404,265

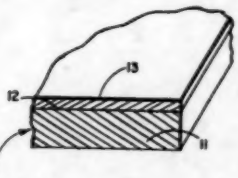
EPITAXIAL COMPOSITE AND METHOD OF MAKING

Harold M. Manasevit, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 385,028, Aug. 2, 1973, abandoned, which is a continuation of Ser. No. 64,835, Oct. 1, 1969, abandoned, which is a continuation-in-part of Ser. No. 705,213, Feb. 13, 1968, abandoned. This application Apr. 7, 1978, Ser. No. 894,368

Int. Cl.³ H01L *29/20*

U.S. Cl. 428—689 **75 Claims**



1. A composite comprising a monocrystalline, electrically insulating, oxide substrate and a single crystal film consisting of a Group III–V semiconductor epitaxially disposed on and in direct contact with said substrate in which the Group III constituent of the semiconductor comprises at least one element selected from the class consisting of gallium and indium.

4,404,266

MINIATURE AIR CELLS WITH SEAL

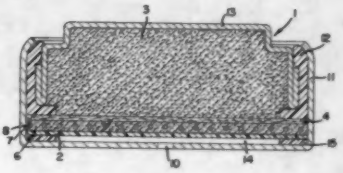
Nicholas J. Smilanich, Rocky River, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 15, 1982, Ser. No. 358,279

Int. Cl.³ H01M *4/00*

U.S. Cl. 429—27 **8 Claims**

1. A miniature air cell comprising a container having a base, an upright sidewall and an open-ended top and having at least one air opening in the base thereof; a cell assembly housed in said container having an air electrode in electrical contact with said container, an anode material situated above the air electrode, a separator layer therebetween, and an electrolyte in ionic contact with said air electrode and said anode material; a cell cover in electrical contact with said anode material; and an electrically insulating gasket interposed and compressed between said cell container and cover; the improvement being a resiliently deformable member having an aperture defined therein, said member coated on at least one surface with a sealing agent and compressively disposed between the base of said cell container and said air electrode such that the aperture defined in said member encompasses the at least one air opening in the base of said cell container thereby forming an air diffusion chamber between said air electrode and said container base and whereby electrolyte creepage past the air electrode and container base into said air diffusion chamber is effectively prevented, and which member provides support for the air electrode.



4,404,267

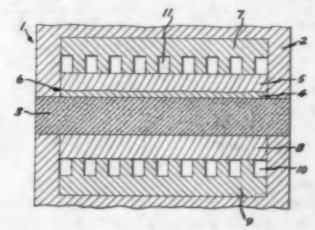
ANODE COMPOSITE FOR MOLTEN CARBONATE FUEL CELL

Charles D. Iacovangelo, Schenectady, and Kenneth P. Zarnoch, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,879

Int. Cl.³ H01M *4/86*

U.S. Cl. 429—41 **4 Claims**



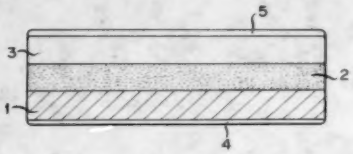
1. An anode composite useful for a molten carbonate fuel cell comprised of a porous sintered anode composed of metal or metal-covered ceramic particles having a porous sintered bubble pressure barrier integrally sintered to one face thereof covering said face, said barrier being comprised of a plurality of metal-coated ceramic particles enveloped by said metal coating sintered together and to said anode by means of said metal coating, said metal coating being selected from the group consisting of nickel, copper and alloys thereof, said ceramic particles being selected from the group consisting of lithium aluminate, strontium titanate, α-alumina and mixtures thereof, said barrier having a pore volume greater than 40% by volume but less than 85% by volume of said barrier, the pores of said barrier having a median pore size significantly less than that of said anode.

4,404,268

SOLID STATE LITHIUM CELL

Atsuo Imai, and Shigeru Matake, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 13, 1981, Ser. No. 320,883
Claims priority, application Japan, Nov. 26, 1980, 55-165282
Int. Cl.³ H01M 6/18
U.S. Cl. 429—191 8 Claims



1. A solid state lithium cell comprising (a) a layer of a cathode-active material, (b) a layer of a solid electrolyte, and (c) a layer of an anode-active material comprised of a lithium metal, which are arranged in the order (a)-(b)-(c); wherein said cathode-active material comprises a solid solution comprised of lead iodide and a relatively very small amount sufficient to improve the discharge characteristic of the cell of at least one element selected from the group consisting of bismuth, antimony, thallium, indium and gallium and iodides thereof solid-solubilized as impurities in the crystal lattice of the lead iodide.

4,404,269

DEVELOPER CONTAINING MAGNETIC AND NON-MAGNETIC TONER

Nobuhiro Miyakawa, Suita; Kouzi Maekawa, Kyoto, and Masanori Fujii, Suita, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1981, Ser. No. 320,938
Claims priority, application Japan, Nov. 17, 1980, 55-160885
Int. Cl.³ G03G 9/14
U.S. Cl. 430—106 8 Claims

1. In a two-component simultaneously consumable, dry-type composite developer which comprises a mixture of magnetic toner particles composed of a dispersion of a powdery magnetic material in an electrically insulating binder resin medium and non-magnetic toner particles composed of a dispersion of a coloring agent in an electrically insulating binder resin medium, the improvement wherein the magnetic toner particles comprise (a) a resin binder medium and (b) 40 to 70% by weight, based on the sum of the binder and powdery magnetic material, of magnetite having a bulk density of at least 0.45 g/ml, a number average maximum size as measured by an electron microscope of at least 0.5 μm and a maximum size/minimum size ratio of from 1.0 to 5.5, the magnetic toner particles have an electrostatic capacitance of 7 to 8.5 pF (picofarad), a dielectric constant of 3.59 to 4.36, and a volume resistivity of $1.2\times10^{-}$ to about 8.6×10^{14} Ω-cm, as determined under conditions of an electrode gap of 0.65 mm, an electrode sectional area of 1.43 cm^2 and an inter-electrode load of 105 g/cm^2, the non-magnetic toner particles comprise (i) a resin binder medium, (ii) 2 to 10% by weight, based on the resin binder medium, of a pigment, and (iii) a negative charge controlling agent composed of a chromium-, iron- or cobalt-containing complex salt dye, and have an electrostatic capacitance of 6.0 to 8.0 pF and a dielectric constant of 3.08 to 4.10, as determined under said conditions, the magnetic toner particles and the non-magnetic toner particles have a friction chargeability characteristic of the same polarity, and the magnetic toner particles and the non-magnetic toner particles are present in the developer at a weight ratio of from 100:1 to 100:30.

4,404,270

POSITIVELY CHARGEABLE POWDERED ELECTROPHOTOGRAPHIC TONER CONTAINING DIALKYL TIN OXIDE CHARGE CONTROL AGENT

Osamu Higashida; Isamu Moribe, both of Hitachi, and Hajime Yamamoto, Kyoto, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed May 21, 1981, Ser. No. 267,577
Claims priority, application Japan, May 22, 1980, 55-68651; May 22, 1980, 55-68652; May 22, 1980, 55-68653; Oct. 3, 1980, 55-139033; Oct. 3, 1980, 55-139034; Oct. 3, 1980, 55-139035
Int. Cl.³ G03G 9/08
U.S. Cl. 430—110 5 Claims

1. A toner which can be charged positively comprising
(a) a resin,
(b) a colorant, and
(c) as a positive charge control agent, a compound selected from the group consisting of dialkyl tin oxides.

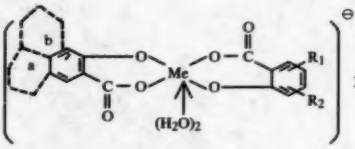
4,404,271

METAL COMPLEXES FOR USE IN DEVELOPERS FOR ELECTROSTATIC IMAGES, CHARGE CONTROL FUNCTION

Yoji Kawagishi, Yawata; Yukihiko Ishida, Neyagawa, and Kazuhiro Ishikawa, Nara, all of Japan, assignors to Orient Chemical Industries, Ltd., Japan

Filed Dec. 11, 1981, Ser. No. 329,996
Claims priority, application Japan, Dec. 22, 1980, 55-182388
Int. Cl.³ G03G 9/00
U.S. Cl. 430—110 31 Claims

1. A toner composition for developing electrostatic images in the form of an admixture of a toner resin and a charge control agent comprising a metal complex having the formula



wherein a or b, only one of which is present, is a corresponding fused benzene or cyclohexene ring moiety which is optionally substituted with a least one alkyl substituent having 4 to 9 carbon atoms, R_1 and R_2 are hydrogen or alkyl substituents having 4 to 9 carbon atoms or together form a corresponding fused benzene or cyclohexene ring moiety which is optionally substituted with at least one alkyl substituent having 4 to 9 carbon atoms, provided that both R_1 and R_2 are not hydrogen at the same time, Me is Cr, Co or Fe, and X is a corresponding counter ion.

4,404,272

LIGHT-SENSITIVE MIXTURE AND COPYING MATERIAL PREPARED THEREFROM WITH NOVOLAK HAVING BROMINATED PHENOL UNITS

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,479
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107109
Int. Cl.³ G03C 1/60, 1/68, 1/70, 1/727
U.S. Cl. 430—192 4 Claims

1. A light-sensitive mixture comprising, as the light-sensitive compound, an o-quinone-diazide or, as a light-sensitive combination of compounds, a mixture of
(a) a compound which releases an acid on exposure, and
(b) a compound containing at least one C—O—C group which can be cleaved by an acid,

the solubility of which mixture in an aqueous-alkaline solution is increased upon exposure, and a novolak containing brominated phenol units wherein the brominated novolak contains about 15 to 50 percent by weight of bromine.

4,404,273

PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC COLOR IMAGES BY THE SILVER DYE BLEACH PROCESS

Eddy Forte, Lausenne; Mario Fryberg, Praroman-le-Mouret, and Gerald Jan, Fribourg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

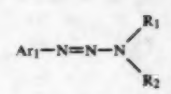
Filed Dec. 2, 1981, Ser. No. 326,786

Claims priority, application Switzerland, Dec. 15, 1980, 9248/80

Int. Cl.³ G03C 7/00, 1/76, 1/40

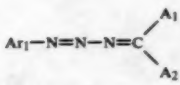
U.S. Cl. 430—377 **25 Claims**

1. A photographic material for the production of photographic colour images by the silver dye bleach process, which process comprises the steps of imagewise exposure, silver development, dye formation, dye bleach, silver bleach and fixing of the photographic material and wherein said process steps, after the development of the image silver are carried out in acid processing solution which contains a phase transfer catalyst capable of transferring cations said photographic material comprising an opaque or transparent base, having thereon at least one silver halide emulsion layer and, in the same layer or in an adjacent layer, containing a dispersion of the oil-soluble triazine of the formula



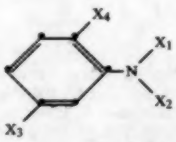
(1)

or



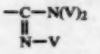
(2)

and an oil-soluble coupling component of the formula



(3)

in a water-insoluble solvent or solvent mixture in which Ar_1 is substituted or unsubstituted aryl or a substituted or unsubstituted aromatic heterocyclic radical, R_1 is hydrogen, substituted or unsubstituted alkyl having 1 to 6 carbon atoms, $-(CH_2CH_2O)_r-L_1$ or $-OL_1$, in which L_1 is alkyl having 1 to 12 carbon atoms and r is 1, 2 or 3, or R_1 is substituted or unsubstituted aryl, hydroxyl or a radical of the formula



in which V is hydrogen or alkyl having 1 to 12 carbon atoms, R_2 is substituted or unsubstituted alkyl having 1 to 6 carbon atoms, $-(CH_2CH_2O)_r-L_1$, with L_1 and r being as defined above, or substituted or unsubstituted aryl, or R_1 and R_2, conjointly with the nitrogen atoms to which they are bonded, form a substituted or unsubstituted, saturated or unsaturated 5-membered, 6-membered or 7-membered ring which may contain a further hetero-atom, A_1 and A_2 independently of one another are an amino group of the formula

in which T_1 and T_2 independently of one another are hydrogen, substituted or unsubstituted alkyl having 1 to 12 carbon atoms or substituted or unsubstituted aryl, X_1 and X_2 independently of one another are hydrogen or substituted or unsubstituted alkyl having 1 to 20 carbon atoms, X_3 is hydrogen, substituted or unsubstituted alkyl having 1 to 6 carbon atoms, substituted or unsubstituted alkoxy having 1 to 20 carbon atoms, $-O(C_2H_4O)_n-H$, $-O(CH_2)_m-OH$, $-O-(CH_2)_m-OZ_1$ or $-O-(C_2H_4O)_n-Z_1$, in which Z_1 is alkyl having 1 to 8 carbon atoms, n is an integer from 1 to 5, and m is 2, 3 or 4, or X_3 is substituted or unsubstituted aryloxy, hydroxyl, halogen, $-NHCO-Y_1$, $-NHCOH$, $-NHCO-OY_1$, $-NHP(O)(OY_1)_2$ or $-NHSO_2-Y_1$, in which Y_1 is substituted or unsubstituted alkyl having 1 to 16 carbon atoms, $-O(CH_2)_m-OH$, $-O-(C_2H_4O)_n-H$, $-O-(CH_2)_m-OZ_1$ or $-O-(C_2H_4O)_n-Z_1$, with Z_1, m and n being as defined above, or Y_1 is substituted or unsubstituted aryl, and X_4 is hydrogen, substituted or unsubstituted alkyl having 1 to 12 carbon atoms, $-O(C_2H_4O)_n-H$, $-O(CH_2)_m-OH$, $-O(CH_2)_m-OZ_1$ or $-O-(C_2H_4O)_n-Z_1$, m and n being as defined above, or X_4 is substituted or unsubstituted alkoxy having 1 to 16 carbon atoms, substituted or unsubstituted aryloxy or halogen, and the total of the carbon atoms in the substituents X_1, X_2, X_3 and X_4 is at least 10.

2. A process for the production of a photographic colour image by the silver dye bleach process, which process comprises imagewise exposure, silver development, dye formation, dye bleaching, silver bleaching and fixing of the photographic material, said photographic material being one of claim 1, and wherein said process steps, after the development of the image silver are carried out in an acid processing solution which contains a phase transfer catalyst capable of transferring cations.

4,404,274

PHOTOGRAPHIC LIGHT SENSITIVE ELEMENT CONTAINING YELLOW COLOR COUPLER AND METHOD FOR FORMING YELLOW PHOTOGRAPHIC IMAGES

Atsuaki Arai; Yasushi Oishi; Akio Okumura, and Kiyoshi Nakazyo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

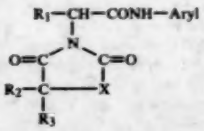
Continuation of Ser. No. 235,937, Mar. 20, 1972, abandoned. This application Apr. 6, 1981, Ser. No. 251,561

Claims priority, application Japan, Mar. 20, 1971, 46-15997

Int. Cl.³ G03C 7/00, 1/40

U.S. Cl. 430—389 **47 Claims**

1. A silver halide emulsion containing a yellow dye-forming coupler of the formula



wherein X is oxygen or sulfur, R_1 is α-pivalyl, and R_2 and R_3 are each hydrogen or alkyl.

4,404,275

INSTANT FILMSTRIP AND METHOD OF MAKING

William J. Hutchinson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 215,889, Dec. 12, 1980, Pat. No. 4,374,195. This application Jul. 9, 1982, Ser. No. 396,571
Int. Cl.³ G03B 17/50; G03C 3/00, 9/02
U.S. Cl. 430—501 4 Claims

1. A method for making a coated sheet of elastic material for photographic film for subsequent application to a relatively non-elastic support, said method comprising the steps of:

applying a layer of relatively elastic material to a relatively inelastic sheet to provide dimensional stability to the elastic layer;

coating at least one layer of photographic material onto said elastic layer; and

stripping said relatively inelastic sheet from said relatively elastic material.

4,404,276

POLYMER COMPOSITIONS CONTAINING CROSSLINKED SILICONE POLYCARBINOL AND HAVING A LOW COEFFICIENT OF FRICTION

David J. Steklenski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,321
Int. Cl.³ G03C 1/76, 1/78, 1/38
U.S. Cl. 430—531 3 Claims

1. A photographic element comprising a support having on one side thereof a hydrophilic, radiation-sensitive layer and on the other side thereof, as the outermost layer, a layer comprising a blend of a major amount of a polymer or polymer blend and a minor amount of a crosslinked silicone polycarbinol.

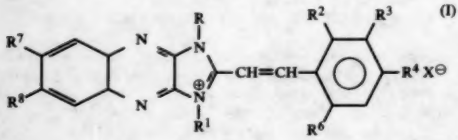
4,404,277

DESENSITIZING DYES FOR PHOTOGRAPHIC EMULSIONS

Ivan H. Skoog, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 21, 1981, Ser. No. 295,015
Int. Cl.³ G03C 1/36
U.S. Cl. 430—597 13 Claims

1. A light-sensitive, fogged, direct positive silver halide emulsion characterized by having therein a desensitizing amount of cyanine dye corresponding to the following formula:



(I)

wherein:

R represents an alkyl group of up to 4 carbon atoms,

R^1 represents an alkyl group of 1 to 4 carbon atoms,

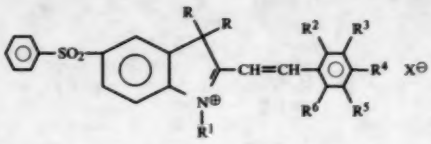
R^2, R^3, and R^4 each independently represent a hydrogen atom or an alkoxy group of up to 4 carbon atoms,

R^6 represents a hydrogen atom or an alkoxy group of up to 4 carbon atoms, with the proviso that at least one of R^2, R^3, R^4, and R^6 is selected from alkoxy groups,

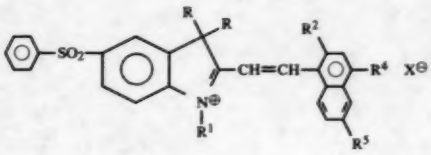
R^7 and R^8 each independently represent a hydrogen atom or an alkyl group of up to 4 carbon atoms, and

X represents an acid anion, selected from chloride, bromide, iodide, sulfonate, perchlorate, p-toluenesulfonate, and methylsulfate.

2. A light-sensitive, fogged, direct positive silver halide emulsion characterized by having therein a desensitizing amount of cyanine dye corresponding to the following formulae:



and



wherein:

R represents an alkyl group of up to 4 carbon atoms,

R^1 represents an alkyl group of 1 to 4 carbon atoms,

R^2, R^3, and R^4 each independently represent a hydrogen atom or an alkoxy group of up to 4 carbon atoms,

R^5 and R^6 each independently represent a hydrogen atom or an alkoxy group of up to 4 carbon atoms, or R^5 and R^6 may be the substituents necessary to form a fused benzene ring which may itself be further substituted by an alkoxy group of up to 4 carbon atoms,

with the proviso that at least two of R^2, R^3, R^4, R^5, and R^6 are selected from alkoxy groups, and

X represents an acid anion, selected from chloride, bromide, iodide, sulfonate, perchlorate, p-toluenesulfonate, and methylsulfate.

4,404,278

METHODS AND COMPOSITIONS FOR ASSAYING FOR THE PRODUCTION OF 1,4-DIHYDROPYRIDYL

Mae W. Hu, Sunnyvale; Floyd W. Colvin, Redwood City, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Nov. 24, 1980, Ser. No. 209,365
Int. Cl.³ G01N 33/54; C12N 9/96
U.S. Cl. 435—7 6 Claims

1. In an assay employing the transformation from the oxidized to the reduced form of a coenzyme having an N-substituted pyridyl prosthetic group by measuring the change in fluorescence of said assay medium as related to the amount of analyte in said assay medium, wherein analyte is combined with receptor for said analyte and an enzyme label is employed requiring said co-enzyme and the amount of co-enzyme formed is related to the amount of analyte in said assay medium, and after combining said analyte and antisera in the presence of said label, said fluoresence is measured,

the improvement which comprises adding antisera capable of cross reacting with meta-substituted benzamide and the reduced form of the coenzyme and capable of binding to the reduced form of the coenzyme in the presence of the oxidized form to enhance the measurement of fluorescence.

4,404,279

METHOD OF CULTURING HYBRIDOMAS

Giulia C. B. A. Ricotti, Hoofddorp, and Willem P. Zeijlemaker, Roelofarendsveen, both of Netherlands, assignors to Stichting Vrienden van de Stichting Dr. Karl Landsteiner, Amsterdam, Netherlands

Filed Jan. 28, 1981, Ser. No. 229,272

Claims priority, application Netherlands, Jan. 29, 1980, 8000527

Int. Cl.³ C12P 21/00; C12N 1/00, 1/38, 15/00

U.S. Cl. 435—68 13 Claims

1. A method for improving the hybridization of different, hybridoma forming cells in an in-vitro culture and for increasing the production of substances formed by the resulting hybridomas, which comprises; culturing hybridomas adding to the culture at least one of endothelial cells or the supernatant of endothelial cells.

8. In a process for the production of monoclonal antibodies by culturing in-vitro an antibody producing hybridoma under antibody producing conditions, the improvement which comprises; employing as one of said conditions the presence of a production enhancing factor obtained from the in-vitro culture of an endothelial cell.

4,404,280

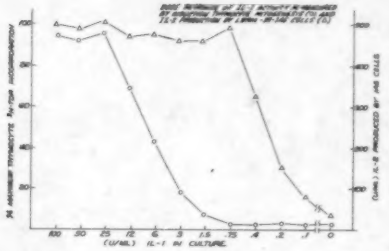
PROCESS FOR PREPARING MURINE INTERLEUKIN 2 IN THE PRESENCE OF INTERLEUKIN 1 FROM AN INTERLEUKIN 2 NONPRODUCER MALIGNANT CELL LINE AND CELL LINE THEREFOR

Steven Gillis, 15509 NE. 198th, Woodinville, Wash. 98072

Filed Jul. 16, 1981, Ser. No. 283,092

Int. Cl.³ C12P 21/00; C12N 5/00, 5/02, 1/00; A61K 37/00; C12R 1/91; C12P 1/00

U.S. Cl. 435—68 13 Claims



1. A process for the production of IL-2, comprising culturing malignant murine T cells from a cell line which is incapable of producing IL-2 by T-cell mitogen stimulation alone, is capable of producing IL-2 and requires IL-1 for IL-2 production, in a culture medium containing a T-cell mitogen and IL-1; and recovering the IL-2 from the culture medium.

13. A malignant murine cell line which is incapable of producing IL-2 by T-cell mitogen stimulation alone but which produces IL-2 in the presence of both a T-cell mitogen and IL-1, having the identifying characteristics of ATCC CRL 8079.

4,404,281

PROCESS FOR ENZYME INHIBITORS

Sean C. O'Connor, Jamesville, N.Y., and Walter M. Nakatsukasa, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 19, 1982, Ser. No. 409,765

Int. Cl.³ C12P 17/12, 17/10; C12R 1/465

U.S. Cl. 435—122 4 Claims

1. In the process for producing angiotensin I converting enzyme inhibitor A-58365 factor A, which comprises culturing *Streptomyces chromofuscus* NRRL 15098 in an aqueous nutrient culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic fermentation conditions, the improvement which comprises supplementing said culture medium with between about 1 g and about 6 g of proline per liter of said medium.

4,404,282

PROCESS FOR ENZYME INHIBITOR

Walter M. Nakatsukasa, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 19, 1982, Ser. No. 409,764

Int. Cl.³ C12P 17/12, 17/10; C12R 1/465

U.S. Cl. 435—122 4 Claims

1. In the process for producing angiotensin I converting enzyme inhibitor A-58365 factor B, which comprises cultivating *Streptomyces chromofuscus* NRRL 15098 in an aqueous nutrient culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under aerobic fermentation conditions, the improvement which comprises supplementing said culture medium with between about 1 g and about 6 g of proline per liter of said culture medium and with between about 1 g and about 3 g of lysine per liter of said culture medium.

4,404,283

LONG CHAIN WAX ESTERS AND METHOD OF MAKING SAME

Saul L. Neidleman, Oakland, and John Geigert, Clayton, both of Calif., assignors to Standard Oil Company (Ind.), Chicago, Ill.

Filed Oct. 10, 1980, Ser. No. 195,876

Int. Cl.³ C12P 7/64; C12R 1/265

U.S. Cl. 435—134 2 Claims

1. A process for the production of wax esters comprising at least 50% by weight unsaturated wax esters comprising aerobically cultivating a microorganism comprising Acinetobacter in an aqueous mineral salts solution on a saturated hydrocarbon feed comprising C_{16} n-alkanes at a temperature within the range of about 15° C. to about 21° C.

4,404,284

MEASUREMENT OF VOLATILE CONSTITUENTS OF A CULTURE MEDIUM

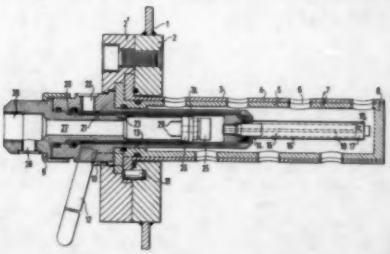
Manfred Heider, Bruun; Josef Hofschneider, Gramatneusiedl; Wolfgang Schallenberger, Graz; Franz Nodes, Vienna, and Eberhard Kempe, Hetzmannsdorf, all of Austria, assignors to Vogelbusch Gesellschaft m.b.H., Vienna, Austria

Filed Dec. 16, 1981, Ser. No. 331,226

Claims priority, application Austria, Dec. 17, 1980, 6153/80

Int. Cl.³ C12M 1/34

U.S. Cl. 435—291 3 Claims



1. A probe for measuring volatile constituents of a culture medium in the fermentation industry comprising an axially elongated pin having a first end and a second end and having an outer surface extending in the first end - second end direc-

tion, at least one helical groove formed in said outer surface and extending in the first end - second end direction, a permeable membrane fitted over the outer surface of said pin and forming a closure over said at least one helical groove so that said helical groove forms a closed flow path, said pin is arranged to extend into a fermentation container and said permeable membrane is arranged to pass volatile constituents from the fermentation container into a carrier medium flowing through said at least one helical groove, said pin forming a blind end bore open at the second end and closed at the first end of said pin, said pin having at least one transverse bore adjacent the first end thereof and interconnecting said blind bore and said at least one helical groove, a probe member, a sensor located within said probe member for responding to the volatile constituents within the carrier medium, said probe member arranged to extend into the fermentation container, said pin supported by and extending from said probe member with the second end of said pin located within said probe member and with the open end of said blind bore opening into said probe member.

4,404,285

PROCESS FOR PREPARING A ZERO STANDARD SERUM

Kenneth C. Hou, San Antonio, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jun. 24, 1981, Ser. No. 276,982

Int. Cl.³ G01N *33/78, 33/96;* **B01D** *39/18, 39/02, 39/04, 39/06*

U.S. Cl. 436—16 **17 Claims**

1. A method for the removal of thyroid hormones from human serum which comprises:

flowing, at a pressure differential higher than 1 psi, said serum through a column containing a composite sheet, said composite sheet comprising a matrix of self-bonding fibers having interdispersed therein carbon particles, such that better than 90% of said carbon particles have an average diameter less than about 50 microns;

thereby removing said thyroid hormones from said serum.

4,404,286

BILIRUBIN ASSAY

Bruce C. Shull, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1982, Ser. No. 351,073

Int. Cl.³ G01N *33/72, 33/92*

U.S. Cl. 436—97 **12 Claims**

1. A method for the assay of total bilirubin which comprises incubating a mixture of bilirubin containing biological fluid, diazo sulfanilic acid, tetramethylene sulfone and a nonionic surfactant, and subsequently measuring the color produced.

4,404,287

METHOD AND APPARATUS FOR DETERMINING CHEMICAL SPECIES

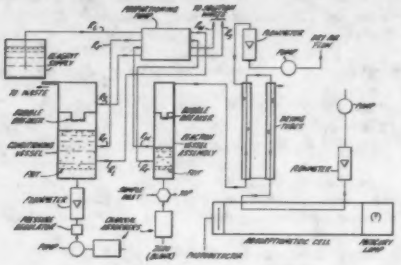
Geoffrey B. Marshall, Chessington, and Derek Midgley, Ashtead, both of England, assignors to Central Electricity Generating Board of Sudbury House, London, England

Filed Nov. 25, 1980, Ser. No. 210,438

Int. Cl.³ G01N *27/66, 33/00*

U.S. Cl. 436—109 **8 Claims**

1. A method for the quantitative determination of a chemical species selected from the group consisting of sulphite, cyanide, sulphur dioxide, aminopolycarboxylic acids and hydroxycarboxylic acids, said species being capable of promoting the disproportionation of Hg_2^{2+} to Hg^{2+} and Hg° in solution, which method comprises causing the species to react with a solution comprising a stable salt of Hg_2^{2+} to thereby produce a measurable concentration of Hg° in a gaseous phase above



the solution, and determining the Hg° present in the said gaseous phase.

4,404,288

METHOD AND APPARATUS FOR CONCENTRATING A VAPOR OF A MERCURY SAMPLE SOLUTION

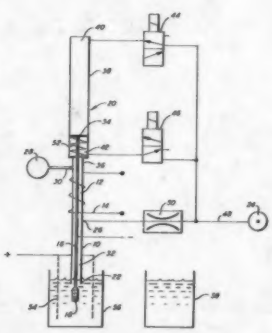
Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 191,567, Sep. 29, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,635

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943092

Int. Cl.³ G01N *23/00, 27/00*

U.S. Cl. 436—177 **13 Claims**



1. A method of concentrating small amounts of mercury from a solution, said method comprising the steps of:

introducing a concentration of amalgam-forming material to said solution;

electrolyzing, by employing an electrode of amalgam-forming material, said solution to separate elemental mercury from said solution and form an amalgam thereof on said electrode;

heating said amalgam to form a concentrated mercury vapor; and

capturing said mercury vapor in a means for measuring said mercury.

3. An apparatus for concentrating small amounts of mercury from a test solution, said apparatus comprising:

a hollow tube having means associated therewith for heating a portion thereof;

a rod, slidably mounted within said tube, having an electrode of amalgam-forming material at one end thereof; and

means for positioning said rod within said tube between a

first position whereat said electrode can be inserted in said test solution whereby an amalgam can be formed on said electrode and a second position whereat said electrode is located in said portion of said tube having means for heating associated therewith, whereby, when said portion is heated, a concentrated mercury vapor is driven off from said amalgam.

4,404,289

METHOD FOR IMMUNOCHEMICAL MEASUREMENT OF TRACE COMPONENTS

Nobuhito Masuda; Shigeru Nagatomo, and Yuji Mihara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,719

Claims priority, application Japan, Sep. 2, 1980, 55-120597; Sep. 2, 1980, 55-120598

Int. Cl.³ G01N *33/54, 33/52*

U.S. Cl. 436—538 **8 Claims**

1. In a photochemical measurement method of a trace component(s) utilizing an immunological reaction which comprises:

labelling an antigen or antibody with a spectral sensitizer,

competitively reacting said antigen or antibody labelled with a spectral sensitizer and an antigen or antibody to be measured with an antibody or antigen which specifically reacts with the respective antigen or antibody,

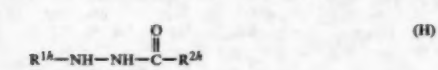
bringing either the reaction product or the unreacted component into contact with silver halide,

exposing the resulting product to light having a wavelength which said spectral sensitizer absorbs,

photographically developing the exposed silver, and,

measuring the resulting optical density of the formed silver image and/or colored dye formed by the photographic development,

said contact with silver halide being performed in the presence of a hydrazine compound of formula (H):



(H)

wherein R^{1h} is an aryl group and R^{2h} is a hydrogen atom, an alkyl group or an aryl group.

4,404,290

GLASSES OF HIGH REFRACTIVE INDEX, LOW DISPERSION, AND LOW DENSITY

Jean E. Boudot, Avon, France, assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 1, 1982, Ser. No. 445,956

Claims priority, application France, Jul. 16, 1982, 82 12447

Int. Cl.³ C03C *3/08*

U.S. Cl. 501—78 **3 Claims**

1. An optical glass exhibiting an index of refraction between about 1.695–1.705, a dispersive index between about 40.5–43.2, a density below about 3.2 g/cm³, a weight loss as measured in the AO test of less than 0.15 mg/cm², and a transmittance at 400 nm in 10 mm thickness of at least 75, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

CaO	16–21.5
La_2O_3	6–15
TiO_2	3.5–<9
Al_2O_3	5.5–12
Nb_2O_5	3–11
ZrO_2	2–10
B_2O_3	20.5–25
SiO_2	16–20

4,404,291

LOW-DENSITY, OPEN-PORE MOLDED INORGANIC BODY WITH A HOMOGENEOUS PORE DISTRIBUTION

Werner Kiefer, Mainz, and Maria Sura, Ingelheim, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 3, 1982, Ser. No. 345,499

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103749

Int. Cl.³ B32B *5/12*

U.S. Cl. 501—81 **20 Claims**

1. A molded sintered porous body comprising at least one of: a conventional glass, a solder glass or a crystallized solder glass, said body having more than 90% of the pores therein of the open-type, said pores being isotropically distributed, and said body having a density of less than 1.0 g/cm³.

4,404,292

REFRACTORY MATERIAL INTENDED ESPECIALLY FOR CONTACTING MOLTEN ALUMINUM AND PROCESS FOR ITS MANUFACTURE

Jean Daviot, St. Cheron, France, assignor to Novatome, Le Plessis Robinson, France

Filed Feb. 19, 1982, Ser. No. 350,532

Claims priority, application France, Mar. 4, 1981, 81 04277

Int. Cl.³ C04B *35/58, 35/65*

U.S. Cl. 501—97 **5 Claims**

1. Refractory material, intended especially for placing in contact with molten aluminum, said material consisting of an aggregate bonded by a cement, wherein the aggregate is consitituted by silicon nitride in a proportion comprising between about 50 percent and about 90 percent of the total weight of the final product, and the cement is constituted by calcium aluminate.

4,404,293

SELF-EXTINGUISHING EXPANDABLE POLYSTYRENE PARTICLES HAVING AN IMPROVED PROCESSABILITY

Giuseppe Cigna; Paolo Catarsi; Maria C. Mussatto; Fabrizio Vivaldini, all of Mantova, and Stefano Campolmi, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

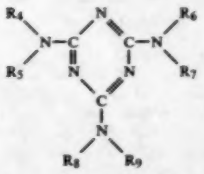
Filed Jun. 30, 1982, Ser. No. 393,547

Claims priority, application Italy, Jul. 3, 1981, 22731 A/81

Int. Cl.³ C08J *9/18*

U.S. Cl. 521—56 **6 Claims**

1. Self-extinguishing expandable polystyrene particles containing an expanding agent, a self-extinguishing organic halogen-containing compound and from 0.0001 to 0.1% by weight, referred to the polymer, of a 2,4,6-triamino-1,3,5-triazine derivative having the general formula:



(I)

wherein at least one of radicals R_4, R_5, R_6, R_7, R_8 and R_9 is hydrogen and each of them, independently of one another, may be: hydrogen; an alkyl radical having from 1 to 20 carbon atoms in which, optionally, a hydrogen atom in ω position may be substituted by a 2,4,6-triamino-1,3,5-triazine radical; a cyclo-alkyl radical having from 5 to 12 carbon atoms or an aryl radical having from 6 to 18 carbon atoms, said alkyl-, cycloalkyl- or aryl-radicals optionally containing functional groups such as halogens, hydroxyl groups, carboxylic groups and esters.

4,404,294

NONFLAMMABLE LIGHT FOAMS CONTAINING UREA AND URETHANE GROUPS IN WHICH A MONO- AND/OR OLIGO-SACCHARIDE DISSOLVED IN WATER IS REACTED WITH A POLYISOCYANATE IN THE PRESENCE OF A POLYOL, A CATALYST AND A FLAMEPROOFING AGENT

Rolf Wiedermann, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,547

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113387

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—107 8 Claims

1. A process for the production of nonflammable light foams containing urea and urethane groups and having a density less than or equal to 0.025 g/cm³ in which a polyisocyanate is reacted with at least one equivalent of water in which a mono- and/or oligosaccharide has been dissolved in the presence of (a) an organic compound having at least two hydroxyl groups and an OH number of from 30 to 250, (b) a catalyst, and (c) a flameproofing agent.

4,404,295

POLYESTER RESINS FOR POLYURETHANE FOAMS

Carl Bernstein, Deerfield; James Stogis, Joliet; Travis Riddle, Justice, and Robert Kufrin, Chicago, all of Ill., assignors to Witco Chemical Corporation, Del.

Division of Ser. No. 263,224, May 13, 1981, Pat. No. 4,349,662. This application Jul. 14, 1982, Ser. No. 398,459

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—172 5 Claims

1. A flexible polyester foam produced from a polyester, liquid at 70° F., comprising the reaction product of a diacid, diethylene glycol, a viscosity increasing diacid replacing some of said diacid, and a poly(oxyethylene) glycol, wherein the resulting resin formulation of 100 parts by weight contains about 1–12 parts by weight of the viscosity increasing diacid, about 1–15 parts by weight of the poly(oxyethylene) glycol and about 0.2–5.5 parts of a cross-linking polyol.

4,404,296

GEL COMPOSITIONS WITH DEPOT ACTION BASED ON A POLYURETHANE MATRIX AND RELATIVELY HIGH MOLECULAR WEIGHT POLYOLS AND CONTAINING ACTIVE INGREDIENTS, AND A PROCESS FOR THEIR PREPARATION

Dietmar Schäpel, Cologne, Del.X, assignor to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 342,035

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103499; Feb. 3, 1981, 3103500

Int. Cl.³ C08L *75/08*

U.S. Cl. 523—105 14 Claims

1. A gel comprising:

(a) 15–62 wt. % (based on (a)+(b)) of a high molecular weight covalently cross-linked polyurethane matrix which polyurethane matrix is produced from an isocyanate and a polyol having functionalities such that the product of those functionalities is at least 5.2;

(b) 85–38 wt. % (based on (a)+(b)) of a liquid dispersing agent which is firmly bonded in the matrix by secondary valence forces; and

(c) 0–100 wt. % (based on (a)+(b)) of a compound selected from the group consisting of fillers, additives, catalysts suitable for an isocyanate polyaddition reaction and combinations thereof

in which the liquid dispersing agent is a polyhydroxyl compound having a molecular weight of between 1,000 and 12,000 and an OH number of between 20 and 112 and in which essentially no hydroxyl compounds having a molecular weight below 800 are present.

4,404,297

INTUMESCENT FIRE RETARDANT COMPOSITIONS

Theodor Fishler; Manny Ravey, and Leonard M. Shorr, all of Haifa, Israel, assignors to Bromine Compounds Ltd., Beer-Sheva, Israel

Filed Jan. 7, 1983, Ser. No. 456,344

Claims priority, application Israel, Feb. 8, 1982, 64952

Int. Cl.³ C09K *3/28*

U.S. Cl. 523—179 18 Claims

1. Intumescent fire retardant synthetic organic polymer compositions containing a thermolized product wherein the thermolysis is carried out above 160° C., said product being obtained from a system comprising P_2O_5 or a P_2O_5—precursor together with triethanolamine, the weight ratio of the components in said system being between 0.05 to 2.0 parts P_2O_5 to 1 part triethanolamine.

4,404,298

AQUEOUS DISPERSIONS BASED ON CELLULOSE NITRATES, POLYESTER OF ALKYD RESINS AND AMINOPLAST RESINS, PROCESSES FOR THE PRODUCTION THEREOF AND THE USE THEREOF FOR THE PRODUCTION OF COATINGS

Hans-Joachim Traenckner, Krefeld, and Wolfgang Kremer, Kerken, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 337,020

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1981, 3100576

Int. Cl.³ C08L *1/18*

U.S. Cl. 524—31 8 Claims

1. Aqueous dispersion of:

(A) from 5 to 35 parts, by weight, of cellulose nitrate;

(B) from 5 to 30 parts, by weight, of polyester and/or alkyd resin;

(C) from 4 to 40 parts, by weight, of aminoplast resin;

(D) from 30 to 300 parts, by weight, of water; and

(E) from 0.5 to 10 parts, by weight, of emulsifier;

characterised in that aminoplast resin (C) is insoluble in water and a mixture of components (A), (B) and (C) is present within the particles of the disperse phase.

4,404,299

COMPOSITIONS FOR THE MANUFACTURE OF HOT-MELT ADHESIVES

Jean-Claude Decroix, Arras, France, assignor to Societe Chimique des Charbonnages-CDF CHIMIE, Paris, France

Filed Apr. 15, 1982, Ser. No. 368,686

Claims priority, application France, Apr. 30, 1981, 81 08736

Int. Cl.³ C08L *91/06*

U.S. Cl. 524—77 11 Claims

1. A composition comprising, per 100 parts by weight, (a) from 20 to 45 parts of at least one tackifying resin, (b) from 0 to 45 parts of at least one compound selected from paraffin, microcrystalline polymeric wax, and esters of a hydrogenated rosinic acid and of a lower alcohol, and (c) from 20 to 70 parts comprising a terpolymer of ethylene having a melt index between 5 and 500 dg/minute and comprising:

from 1 to 10 mol% of units derived from an ester selected from alkyl acrylates and methacrylates, said alkyl group having from 1 to 6 carbon atoms, and

from 0.3 to 3 mol% of units derived from maleic anhydride.

4,404,300

POLYSTYRENE PROCESS

Unto K. Koski; Hamdy Khalil, and Adrian Cassola, all of Sarnia, Canada, assignors to Polysar Limited, Ontario, Canada

Filed Feb. 16, 1982, Ser. No. 348,771

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—91 5 Claims

1. An improved process for the preparation of impact polystyrene wherein polybutadiene having a 1,4-content of at least

about 80% is dissolved in styrene monomer and the resulting solution containing from about 1 to about 15 weight percent of polybutadiene based on the weight of polybutadiene plus styrene monomer is polymerized by a thermal process with or without added free radical polymerization initiators, said polymerization being such as to achieve 85 percent or more conversion of the styrene monomer to polymer, the improvement being that at least part of the polybutadiene contains from about 75 to about 300 parts per million by weight of the polybutadiene of an optical brightener selected from the group consisting of aryl substituted triazole substituted aryl coumarins and bis(benzoxazolyl) substituted thiophenes.

4,404,301

POLYMERIC LIGHT STABILIZERS HAVING AT LEAST ONE 2,2,6,6-TETRAALKYL PIPERIDYL GROUP AND SYNTHETIC RESIN COMPOSITIONS CONTAINING THE SAME

Naohiro Kubota, Ageo; Toshihiro Shibata, Omiya, and Ryozo Arata, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Apr. 22, 1982, Ser. No. 370,900

Claims priority, application Japan, Apr. 23, 1981, 56-61764

Int. Cl.³ C08K *5/34;* **C08L** *67/00;* **C07D** *211/08*

U.S. Cl. 524—99 **26 Claims**

1. Polymeric light stabilizers for synthetic polymers comprising a polymer molecule made of polymer units having a molecular weight within the range from about 1000 to about 20,000 and including a plurality of polymer units having at least one 2,2,6,6-tetraalkyl piperidyl group, the polymer units being selected from the group consisting of unsaturated carboxylic acid ester units selected from the group consisting of unsaturated cycloaliphatic mono-, di-, and tricarboxylic acid ester units having from seven to about thirty carbon atoms; unsaturated branched-chain aliphatic di- and tricarboxylic acid ester units having from four to about thirty carbon atoms; sorbic acid ester units, 3,8-nonadienyl acid ester units, oleic acid ester units, linolenic acid ester units, and ricinoleic acid ester units; and copolymer units of at least one unsaturated monomer copolymerizable therewith.

4,404,302

ACYLATED HINDERED HEXAHYDROPYRIMIDINES AND THEIR USE AS LIGHT STABILIZING AGENTS

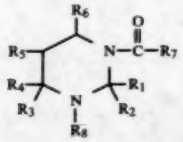
Goutam Gupta, Homewood, Ill., and Chester E. Ramey, Chagrin Falls, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Filed May 27, 1982, Ser. No. 382,556

Int. Cl.³ C08K *5/34;* **C07D** *237/00, 237/02, 239/02*

U.S. Cl. 524—100 **35 Claims**

1. An acylated, hindered hexahydropyrimidine of the formula



wherein

R_1, R_2, R_3 and R_4 may be the same or different independently of each other and are selected from the group consisting of: alkyl having 1 to 6 carbon atoms, when unsubstituted, or substituted with one methyl, ethyl, or phenyl group, aryl, and aryl substituted with 1 to 3 substituents selected from the group consisting of lower alkyl, lower alkoxy, and hydroxyl, and wherein R_1 together with R_2, and R_3 together with R_4, each taken together with the respective ring carbon to which they are attached, may form respectively a cycloalkyl of ring size from 4 to 7 carbons;

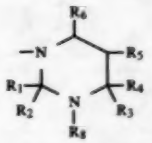
R_5 and R_6 may be the same or different and are selected from the group consisting of hydrogen, and alkyl having 1 to 6 carbon atoms, and arylalkyl, and R_5 together with R_6 and the two ring carbons to which they are attached respectively may form a cycloalkyl group of ring size from 5 to 7 carbon atoms;

R_7 is selected from the group consisting of: alkyl having 1 to 20 carbon atoms, substituted alkyl where the alkyl without substitution has 1 to 20 carbon atoms and where substituents may be up to five lower alkyl groups, arylalkyl, cycloalkyl having 3 to 12 carbon atoms, aryl, aryl substituted with 1 to 3 substituents selected from the group consisting of: lower alkyl, lower alkoxy, and hydroxyl;

$$-OR_9,\ -NHR_9,\ -ACOR_{10},\ \text{and}\ -\underset{\underset{H}{|}}{N}ANHCOR_{10},$$

wherein

R_9 is selected from the group consisting of alkyl having 1 to 20 carbon atoms unsubstituted, or substituted with up to 5 lower alkyl groups, and cycloalkyl having 5 to 11 carbons and phenyl; wherein A is: alkylene of 1 to 12 carbons; alkylene substituted with alkyl or alkenyl to have a total of up to 18 carbons; alkenylene of 2 to 4 carbons; cycloalkylene of up to 12 carbon atoms; cycloalkenylene of up to 12 carbon atoms; bicycloalkylene up to 8 carbon atoms; bicycloalkenylene up to 8 carbon atoms; or phenylene, and wherein R_{10} is selected from the group consisting of hydroxyl, lower alkoxy, phenoxy and the group



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are as defined above,

and

R_8 is selected from the group consisting of hydrogen, alkyl having 1 to 10 carbon atoms, substituted alkyl having 1 to 10 carbon atoms, arylalkyl, hydroxyl, oxyl and

wherein R_{11} is selected from the group consisting of alkyl having 1 to 20 carbon atoms unsubstituted, or substituted with up to five lower alkyl groups

wherein the substitution in substituted alkyl consists of from 1 to 3 substituent alkyl groups of up to 18 carbons each, which substituent groups may be the same or different,

and

wherein the substitution in substituted aryl consists of from 1 to 3 substituent groups that may be the same or different and that are selected from the group consisting of hydroxyl and lower alkyl.

4,404,303

CARBONATE POLYMERS CONTAINING A BARBITUATE AS AN IGNITION DEPRESSANT

Lowell S. Thomas, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 24, 1982, Ser. No. 361,318
Int. Cl.³ C08K 5/34
U.S. Cl. 524—100 6 Claims

1. A composition comprising a carbonate polymer having dispersed therein a thermally stable barbituate in an amount sufficient to retard combustion when the composition is exposed to a low temperature ignition source.

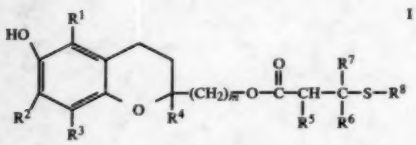
4,404,304

CHROMAN DERIVATIVES USEFUL AS STABILIZERS FOR POLYPROPYLENE AND β-CAROTIN

Michael Horner, Neustadt; Dieter Horn, Heidelberg; Erik Lueddecke, and Gernot Teege, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1982, Ser. No. 344,191
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103707
Int. Cl.³ C07D 311/72; C08K 5/09
U.S. Cl. 524—110 7 Claims

1. A chroman derivative of the general formula I



I

where R^1, R^2, R^3, R^4 and R^5 are each H or C_1–C_4-alkyl, R^6 and R^7 are each H, C_1–C_4-alkyl or aryl, m is 1, 2 or 3, and R^8 is C_1–C_{30}-alkyl or alkenyl of up to 30 carbon atoms.

3. A method of stabilizing polypropylene and beta-carotin from the detrimental effects of light, heat and oxidizing agents which comprises: adding to said materials a stabilizing amount of a chroman derivative I as defined in claim 1.

4,404,305

FLAME RETARDANT POLYORGANOSILOXANE RESIN COMPOSITIONS

Beth I. Gutek, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Feb. 16, 1982, Ser. No. 349,214
Int. Cl.³ C08L 83/04
U.S. Cl. 524—118 12 Claims

1. A translucent, flame retardant composition consisting essentially of

A. 100 parts by weight of a polyorganosiloxane resin,

B. from 1 to 10 parts by weight of an organic compound containing at least one halogen atom, selected from the group consisting of bromine and chlorine, and

C. from 10 to 100 parts by weight of glass particles having an average particle size are from 5 to 100 microns;

the weight ratio of said organic compound to the glass particles being from 0.05 to 0.4.

4,404,306

BLENDS OF WATER REDUCIBLE ORGANIC MATERIALS AND AQUEOUS METAL AMMINE SILICONATE SOLUTIONS

William H. Daudt; Cecil L. Frye, both of Midland, Mich., and James F. Hyde, Marco Island, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 78,415, Sep. 24, 1979. This application Jun. 26, 1981, Ser. No. 277,787
Int. Cl.³ C08L 1/08, 3/00, 5/00; D05B 65/00
U.S. Cl. 524—262 5 Claims

1. A blend which comprises water reducible organic materials and an aqueous metal ammine siliconate solution comprising the reaction products of

(a) oxides and hydroxides of metals, metal derivatives or mixtures thereof which are selected from a group consisting essentially of metals of group IB and metals of group IIB of the Periodic Table of the Elements, which are not more acidic than the silanols or siloxanols produced in (c), which dissolve in the reaction mixture to yield metal ammine cations in the presence of $R—NH_2$;

(b) $R—NH_2$ where R is H, aminoalkyls with 2–6 carbon atoms, or mixtures thereof and wherein the $—NH_2$ molar concentration is equal to at least n times the molar concentration of the metal or metal derivative where n is the coordination number of the metal;

(c) a mono-organosilicon material which can undergo hydrolysis in the presence of the other reactants to yield mono-organosilanols or siloxanols, and hydrolysis products which are not more acidic than the silanols or siloxanols, wherein the organo moiety in the mono-organosilicon material contains up to about 50 carbon atoms and is selected from the group consisting of saturated and unsaturated hydrocarbons having from 1 to about 6 carbon atoms, halohydrocarbons having up to 6 carbon atoms and wherein the halo substitution is at a location other than the alpha or beta locations, aminohydrocarbons, radicals containing one or more ether or thioether linkages, hydroxyfunctional alkyl radicals, carbomethoxyalkyl radicals, carbamoylalkoxy radicals, quaternary ammonium or phosphonium bearing alkyl radicals and mixtures thereof, the mono-organosilicon material being present in an amount sufficient to yield a silicon/metal ratio of from about 1 to about 10; and

(d) water.

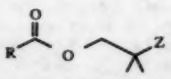
4,404,307

OXOALKYL ESTERS, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

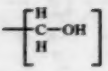
Michael Licciardello, Farmingdale; Richard M. Boden, Monmouth Beach; Hugh Watkins, Lincroft, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 307,366, Oct. 1, 1981, Pat. No. 4,368,145. This application Jul. 8, 1982, Ser. No. 396,257
Int. Cl.³ C08K 5/09, 5/10, 5/12, 5/13
U.S. Cl. 524—290 10 Claims

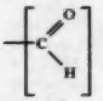
1. A process for augmenting or enhancing the aroma of a thermoplastic polymer comprising the step of intimately admixing with a polymer melt and aroma augmenting or enhancing quantity of at least one oxoalkyl ester defined according to the structure:



wherein Z is a moiety selected from the group consisting of carbinol having the structure:



and carboxyaldehyde having the structure:



and R is selected from the group consisting of 3-heptanyl and phenyl whereby a heterogeneous mixture is produced wherein the perfume base is in the form of microdroplets intimately dispersed throughout the polymer melt phase and then chilling the polymer at such a rate as to cause the microdroplets of perfume oil to be retained as microdroplets which are interconnected with micropores among the microdroplets and to the surface of the resulting polymer.

4,404,308

LOW TEMPERATURE CURING THERMOSETTING COATINGS FOR SOLVENT-SENSITIVE MOLDINGS

Frank J. Ragas, Willow Springs; Ralph L. Minnis, Des Plaines; Edward J. Murphy, Mt. Prospect, all of Ill., and Steve J. Vargo, Brighton, Mich., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed May 24, 1982, Ser. No. 381,175

Int. Cl.³ B05D *3/02*

U.S. Cl. 524—379 **11 Claims**

1. A low temperature curing solution coating composition adapted to be applied to solvent-sensitive thermoplastic moldings and cured at an elevated temperature without damaging said moldings comprising, a solvent medium consisting essentially of alcoholic solvents, said solvent medium having dissolved therein a self-curing solution copolymer of monoethylenically unsaturated monomers comprising nonreactive monomer and from 5% to 30% of the weight of the copolymer of an ether of an N-methylol functional monomer, said solution of copolymer in alcoholic solvent medium being catalyzed with from 3% to 12%, based on the weight of the copolymer, of a long chain dialkyl naphthalene disulfonic acid.

4,404,309

PROCESS OF PREPARING COPOLYMER OF LOWER CARBOXYLIC ACID AND ESTER THEREOF

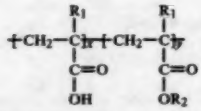
William F. Masler, III, Hinckley, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 29, 1981, Ser. No. 288,225

Int. Cl.³ C08F *20/06;* **C08K** *5/05*

U.S. Cl. 524—379 **10 Claims**

1. A one-pot process for preparing an alcoholic solution of a copolymer of an unsaturated monocarboxylic acid and an ester thereof, said copolymer having the structure



wherein,

R_1 represents hydrogen and methyl;

R_2 represents methyl, ethyl, propyl, and butyl;

x represents from 2 to 50 weight percent (wt %) based on the combined weight of x and y;

y represents from 50 to 98 wt % based on the combined weight of x and y; and,

the sum of the numerical values of x+y is always 100 and the groups x and y are present in an heterogenous relative order, said process comprising,

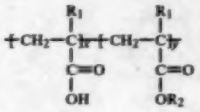
(a) reacting a reaction mixture comprising (meth)acrylic acid, and optionally ester(s) thereof, and a lower aliphatic monohydric alcohol R_2OH, wherein R_2 has the same meaning as above in the presence of an acid esterification catalyst and a polymerization initiator, at the reflux temperature of said reaction mixture,

(b) removing the water formed from the reaction, and

(c) recovering an alcoholic solution of said copolymer.

2. The process of claim 1 comprising, after removing said water, neutralizing said esterification catalyst in said reaction mixture, and removing a desired portion of said lower aliphatic alcohol by azeotropic distillation.

6. A one-pot process for preparing an alcoholic solution of a copolymer of an unsaturated monocarboxylic acid and an ester thereof, said copolymer having the structure



wherein,

R_1 represents hydrogen and methyl;

R_2 represents methyl, ethyl, propyl, and butyl;

x represents from 2 to 50 weight percent (wt %) based on the combined weight of x and y;

y represents from 50 to 98 wt % based on the combined weight of x and y; and,

the sum of the numerical values of x+y is always 100 and the groups x and y are present in a heterogenous relative order, said process comprising,

(a) esterifying by heating to reflux a mixture comprising (meth)acrylic acid and a lower aliphatic monohydric alcohol R_2OH, wherein R_2 has the same meaning as above, in the presence of an esterification catalyst to form an ester,

(b) removing the water formed from the esterification reaction, thereafter

(c) adding polymerization initiator and optionally (meth)acrylate to form a reaction mixture and reacting said reaction mixture at the reflux temperature of said reaction mixture, and

(d) recovering an alcoholic solution of said copolymer.

4,404,310

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 153,743, Jun. 16, 1980, Pat. No. 4,311,809, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Oct. 13, 1981, Ser. No. 310,021

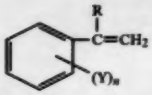
Int. Cl.³ C08K *3/20, 3/02*

U.S. Cl. 524—457 **8 Claims**

1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturted monomer and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1 M, NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

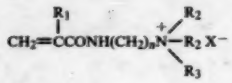
said monomer (1) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl

methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula

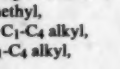


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, and said prepolymer (2) being the addition polymerization product of

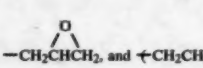
(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein n is an integer 1, 2, or 3,
R_1 is hydrogen or methyl,
R_2 is hydrogen or a C_1-C_4 alkyl,
R_3 is hydrogen, a C_1-C_4 alkyl,



where Y is selected from the group consisting of hydroxyl and halogen,



where n is an integer 1 or more and X^- is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomer (1) employed, said prepolymer moiety of the particles having chemically bonded thereto a cellulose reactive group said group being introduced by means of an aldehyde.

4,404,311

NOVEL COMPOUNDS AND THEIR USE IN ELASTOMER-CONTAINING COMPOSITIONS

Thomas C. Mathis, St. Louis, Mo., and Albert W. Morgan, Collinsville, Ill., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 290,621, Aug. 10, 1981, Pat. No. 4,368,341, which is a continuation-in-part of Ser. No. 187,232, Sep. 15, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 422,620

Int. Cl.³ C08K *5/01, 5/03*

U.S. Cl. 524—486 **21 Claims**

1. A composition comprising a normally solid, essentially organic elastomer and at least one compound consisting of at least 5 hydrocarbon rings including at least one aromatic ring and at least one saturated ring free to rotate independently of at least one aromatic ring in the molecule of said compound, at least one divalent aliphatic radical linking two of said rings, and from zero to about two alkyl substituents on said rings, said compound having a molecular weight between about 400 and about 8,000.

4,404,312

FIBER-REINFORCED POLYMER BLEND COMPOSITION

Tokio Kokubu, and Katsuo Take, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1982, Ser. No. 369,671

Claims priority, application Japan, Apr. 17, 1981, 56-58849; Jul. 24, 1981, 56-116876; Jul. 30, 1981, 56-119615

Int. Cl.³ C08L *23/14, 77/00*

U.S. Cl. 524—504 **12 Claims**

1. A fiber-reinforced polymer blend composition comprising (a) a polyamide resin, (b) a modified polypropylene resin having a melt flow index of 1 to 50 g/10 minutes and at least one carboxyl group in the molecule and (c) a fiber-reinforcing agent, the weight ratio of the polyamide resin (a) and the polypropylene resin (b) being from 70:30 to 95:5 and a content of the fiber-reinforcing agent (c) being from 50 to 200% by weight on the basis of the total amount of the polyamide resin (a) and the polypropylene resin (b).

4,404,313

FLAME RETARDANT-SMOLDER RESISTANT TEXTILE BACKCOATING

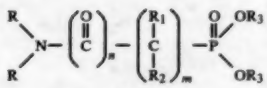
George J. Leitner, Peekskill, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 31, 1981, Ser. No. 297,549

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—512 **6 Claims**

1. A flame and smolder retardant composition for back-coating textile material comprising an effective amount of an aminophosphonate ester in combination with a thermosetting nitrogen containing resin and a reactive latex copolymer compound wherein the aminophosphonate ester has the formula:



wherein R is an alkyl or hydroxyalkyl radical containing from 1 to 3 carbon atoms R_1 and R_2 are alkyl radicals containing from 1 to 6 carbon atoms or hydrogen, R_3 which may be the same or different is an alkyl, hydroxyalkyl, haloalkyl, alkoxyalkyl or hydroxyalkoxyalkyl radical containing from 1 to 6 carbon atoms, the terminus of an alkylene forming a six-membered ring or halogenated analogs, the terminus of an alkylene or alkyleneoxyalkylene bonded to a like phosphorus ester group, hydroxypolyoxyalkylene or hydroxy-substituted analogs thereof n is an integer from 0–1 and m is an integer from 1–2.

4,404,314

PREPARATION OF STABLE AQUEOUS DISPERSIONS OF POLYOLEFIN FIBERS

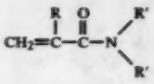
Harold Jabloner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 12, 1982, Ser. No. 338,931

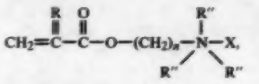
Int. Cl.³ C08L *33/26*

U.S. Cl. 524—519 **8 Claims**

1. A process of forming a stable aqueous dispersion of spurted polyolefin fibers comprising intimately contacting said fibers with an aqueous solution containing from about 0.25 to about 2.0% by weight, based on the weight of said fibers, of a cationic, water-soluble acrylic polymer formed by the copolymerization of from about 60 to about 85% by weight of an acrylamide having the formula



with from about 15 to about 40% by weight of an acrylate or methacrylate ester having the formula



the amount of each monomer being based on the total monomers charged, R being hydrogen or methyl, R′ being hydrogen, methyl or ethyl, R″ being methyl or ethyl, at least one R″ being methyl when X is the methyl sulfate anion, X alternatively being the chloride anion, and n is 1 to 4, the pH of said aqueous solution containing said acrylic polymer having been adjusted to be in the range of from about 9.5 to about 12 either prior to, during or after contacting said fibers with said solution, thereby forming modified fibers.

4,404,315

MOLDING COMPOSITIONS AND DIAPHRAGMS, ARM PIPES AND HEAD SHELLS MOLDED THEREFROM

Tsunehiro Tsukagoshi; Etsuro Nemoto; Shinichi Yokozseki; Sumio Hagiwara; Toshikazu Yoshino; Yasuyuki Arai, all of Ohmori-nishi, and Kazuyoshi Kobayashi, Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 8, 1980, Ser. No. 147,866

Claims priority, application Japan, May 28, 1979, 54-06949; May 5, 1979, 54-069409; Jun. 5, 1979, 54-069410; Jun. 5, 1979, 54-069412

Int. Cl.³ C08L *31/04, 35/04, 27/04*

U.S. Cl. 524—521 **5 Claims**

1. A molding composition comprising 10–90% by weight of a thermoplastic resin mixture and 90–10% by weight of a flaky graphite, the resin mixture comprising a first thermoplastic resin having a glass transition temperature higher than room temperature and a second thermoplastic resin having a glass transition temperature lower than room temperature, said second resin being 10 to 50% by weight based on the total weight of said first and second thermoplastic resins,

said first thermoplastic resin being selected from the group consisting of polyvinyl chloride, a vinyl chloride-vinyl acetate copolymer and a vinyl chloride-acrylonitrile copolymer, and

said second thermoplastic resin being selected from the group consisting of polyvinylidene chloride, vinylidene chloride-vinyl chloride copolymer and a vinylidene chloride-acrylonitrile copolymer.

4,404,316

CHEMICALLY MODIFIED ASPHALT COMPOSITIONS

Alfred Marzocchi; Michael G. Roberts; Charles E. Bolen, and Edward L. Harrington, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 182,332, Aug. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 166,740, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 45,048, Jun. 4, 1979, abandoned. This application Nov. 3, 1981, Ser. No. 317,719

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—522 **16 Claims**

1. A chemically-modified asphalt composition comprising an asphalt which has been reacted with (1) a polymerizable vinyl aromatic monomer, (2) a rubbery polymer which is at least partially uncured and/or unvulcanized and (3) reclaimed rubber.

4,404,317

POLYAMIDE BLENDS

Bennett N. Epstein, Wilmington, Del., and Rolando U. Pagilagan, Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 281,907, Jul. 9, 1981, abandoned. This application Sep. 29, 1982, Ser. No. 427,479

Int. Cl.³ C08L *77/00*

U.S. Cl. 524—538 **14 Claims**

1. A thermoplastic molding resin comprising

(a) about 5 to 98 percent by weight of at least one thermoplastic semicrystalline polyamide of film-forming molecular weight, and complementally,

(b) about 95 to 2 percent by weight of at least one thermoplastic amorphous copolyamide consisting essentially of

(i) 40–98 mole percent units of isophthalic acid based on total acids present,

(ii) 2–60 mole percent units of terephthalic acid based on total acids present,

(iii) 50–98 mole percent units of hexamethylene diamine based on total amines present; and

(iv) 2–50 mole percent units of bis(p-aminocyclohexyl)methane, based on total amines present

wherein in the amorphous copolyamide the mole percent phthalic acids present totals 100 percent and the mole percent diamines present totals 100 percent, and wherein up to 40 percent of the amorphous copolyamide may consist of units of a lactam, or an ω-aminoacid of 4–12 carbon atoms, or units derived from a 4–12 carbon atom aliphatic dicarboxylic acid and a 2–12 carbon atom aliphatic diamine.

4,404,318

PIGMENT DISPERSION

Tetsuo Higuchi; Teiitsu Takagi; Toshihide Fujitani, and Yasuhiko Haruta, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Continuation of Ser. No. 217,539, Dec. 17, 1980, abandoned. This application Feb. 26, 1982, Ser. No. 352,877

Claims priority, application Japan, Dec. 29, 1979, 54-172051; Dec. 29, 1979, 54-172053

Int. Cl.³ C08L *67/00*

U.S. Cl. 524—588 **5 Claims**

1. In a pigment dispersion comprising a pigment, a dispersing agent and an organic dispersing medium, the improvement wherein the dispersing agent is the reaction product of both an alkyd resin and an amino resin with a silane coupling agent.

4,404,319

THERMOSETTING MOLDING COMPOSITIONS

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 1, 1981, Ser. No. 279,438

Int. Cl.³ C08F *218/14*

U.S. Cl. 525—39 **19 Claims**

1. A curable liquid composition comprising:

(a) an unsaturated ester characterized by the following empirical formula:

$$[HOC—CH=CHC—O]_n—R—(OH)_m \quad (I)$$

wherein n is a number having an average value of about 1.5 to less than about 4, m is equal to the free valence of R less the average value of n, R is the hydroxyl-free residue of an organic polyol or polyester which contained from 2 to 4, inclusive, hydroxyl groups, OH, in formula (I), (b) maleic anhydride, (c) an ethylenically unsaturated monomer copolymerizable with (a) and (b), and (d) an initiator selected from the group consisting of peroxyketal, ketone peroxide and alkyl hydroperoxide, wherein the composition has an acid number greater than about 40.

11. A composition as defined in claim 1 which additionally contains an unsaturated polyester, said unsaturated polyester being different from (a).

4,404,320

POLYURETHANE COMPOSITION FOR POWDER COATING

Jugo Goto, Kawanishi; Kazutaka Mochizuki, Osaka; Tsutomu Kubota, Kyoto, and Reiji Miyamoto, Ichihara, all of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

Filed Aug. 12, 1981, Ser. No. 292,187

Claims priority, application Japan, Aug. 18, 1980, 55-113703

Int. Cl.³ C08L 29/04, 75/06

U.S. Cl. 525—58 11 Claims

1. A polyurethane based powder composition for powder coating uses, consisting essentially of a combination of a completely or partially blocked isocyanate compound or mixtures thereof and a hydroxyl-containing compound, the hydroxyl-containing compound being

(A) A hydroxyl-containing polymer, or its carboxyl-modified product, obtained by hydrolyzing a copolymer of a vinyl ester of a saturated monocarboxylic acid and other polymerizable vinyl monomers, and

(B) A polyester polyol of a softening point not lower than 40° C., containing not less than 30 weight % of cyclohexylene, cyclohexenylene groups or spiro rings.

4,404,321

COMPOSITIONS COMPRISING COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN UNSATURATED CYCLIC ANHYDRIDE AND IMPACT IMPROVERS

Visvaldis Abolins, Delmar, N.Y.; John C. Goossens, Mount Vernon, Ind.; Fred F. Holub, Schenectady, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 163,422, Jun. 27, 1980, abandoned, which is a division of Ser. No. 839,905, Oct. 6, 1977, Pat. No. 4,234,701. This application Dec. 23, 1981, Ser. No. 333,984

Int. Cl.³ C08L 61/04

U.S. Cl. 525—68 12 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(a) a rubber modified copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride,

(b) an impact modifier consisting essentially of a graft copolymer consisting essentially of acrylic ester units in combination with vinyl aromatic units and a diene rubber,

(c) a polyphenylene ether resin, and

(d) an effective ductile impact strength improving amount of a low molecular weight normally liquid butadiene oligomer.

4,404,322

HEAT RESISTANT RESIN COMPOSITION

Kiyotaka Saito; Tomoyuki Kitsunai, both of Machida, and Shozo Hori, Ayase, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 340,909

Claims priority, application Japan, Jan. 28, 1981, 56-11157; Jan. 28, 1981, 56-11158

Int. Cl.³ C08L 37/00, 51/04

U.S. Cl. 525—74 10 Claims

1. A thermoplastic resin composition comprising:

(a) 20 to 90 parts by weight of an iminated polymer having imino groups prepared from a copolymer having a weight average molecular weight of not less than 10,000 and obtained by copolymerizing 40 to 90% by weight of an aromatic vinyl monomer, 5 to 40% by weight of maleic acid anhydride and 5 to 40% by weight of a vinyl monomer copolymerizable with said aromatic vinyl monomer and said maleic acid anhydride, said iminated polymer being obtained by reacting the copolymer with one selected from the group consisting of ammonia, a primary amine and mixtures thereof and said copolymerizable vinyl monomer selected from the group consisting of acrylonitrile, acrylic esters, methacrylic esters, acrylic acid, methacrylic acid and mixtures thereof;

(b) 10 to 60 parts by weight of a graft copolymer prepared by grafting 30 to 80 parts by weight of a monomer mixture consisting of 40 to 80% by weight of an aromatic vinyl monomer, 20 to 40% by weight of a cyanated vinyl monomer and 0 to 30% by weight of a vinyl monomer copolymerizable with said aromatic vinyl monomer and said cyanated vinyl monomer upon 20 to 70 parts by weight of a rubber-like polymer; and

(c) 0 to 80 parts by weight of a styrene base copolymer prepared from 40 to 100% by weight of an aromatic vinyl monomer, 0 to 40% by weight of a cyanated vinyl monomer and 0 to 40% by weight of a vinyl monomer copolymerizable with said aromatic vinyl monomer and said cyanated vinyl monomer.

4,404,323

POLYMER COMPOSITION OF α-METHYL STYRENE/ACRYLONITRILE COPOLYMER AND GRAFT COPOLYMER

Jozef L. M. van der Loos, Sittard, and Jan Tijssen, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jun. 23, 1981, Ser. No. 276,637

Claims priority, application Netherlands, Jul. 1, 1980, 8003799

Int. Cl.³ C08L 51/04, 25/16

U.S. Cl. 525—86 6 Claims

1. A polymer composition composed of one or more graft copolymers of styrene and acrylonitrile on a rubber and a copolymer of α-methylstyrene and acrylonitrile, wherein the composition consists essentially of:

A. a graft copolymer obtained by polymerizing 50 to 80 parts by weight of
20 to 40% by weight of acrylonitrile,
50 to 80% by weight of styrene, and
0 to 30% by weight of one or more other monomers
in the presence of 20 to 50 parts by weight of rubber (with respect to 100 parts by weight of graft copolymer), and

B. a copolymer of α-methylstyrene and acrylonitrile obtained by polymerizing a mixture of 60–80 parts by weight of α-methylstyrene and 20–40 parts by weight of acrylonitrile, of which copolymer the spiral flow length (S) is at least 65 and the flow index (V) at most 45, and the ratio between spiral flow length and the flow index is at least 3.0,

and in which polymer composition 35 to 80% by weight of copolymer (B) of α-methylstyrene and acrylonitrile is present.

4,404,324

CURABLE ADHESIVE

Jürgen Fock, Düsseldorf, and Dietmar Schedlitzki, Essen, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,413

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047926

Int. Cl.³ C08G 18/62; C08F 8/30; C08L 75/00

U.S. Cl. 525—123 8 Claims

1. A curable adhesive comprising as the active components:

(a) a copolymer obtained by the polymerization of:

(a_1) 25 to 64.8 weight percent of one or more alkyl esters of acrylic or methacrylic acid having 1 to 8 carbon atoms in the alkyl radical,

(a_2) 20 to 40 weight percent of acrylonitrile, methacrylonitrile or vinyl acetate,

(a_3) 15 to 35 weight percent of one or more ω-hydroxyalkyl esters of acrylic or methacrylic acid having 1 to 5 carbon atoms in the alkyl radical,

(a_4) 0.2 to 5 weight percent of glycidyl acrylate or glycidyl methacrylate, and

(a_5) 0 to 35 weight percent of monomers selected from the group consisting of vinyl propionate, styrene, acrylamide, and methacrylamide in the presence of mercapto group-containing controllers, which have at least one hydroxyl group in the molecule, the sum of the monomers (a_1) to (a_4) adding up to 100 weight percent and the copolymer having an average molecular weight of 800 to 2,500, and

(b) one or more polyisocyanates or their partial reaction products with polyols, in which the molecule possesses on the average, at least 2 isocyanate groups,

the components (a) and (b) being present in such a ratio that 1 to 1.3 isocyanate groups of component (b) correspond to one hydroxyl group of component (a).

4,404,325
HIGH IMPACT NYLON COMPOSITION CONTAINING COPOLYMER ESTERS AND IONIC COPOLYMERS

Charles D. Mason, Chatham, and Harold W. Tuller, Long Valley, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 11, 1981, Ser. No. 262,016
Int. Cl.³ C08F *8/30*
U.S. Cl. 525—179 **53 Claims**

1. A composition comprising:

about 46 percent to about 74 percent by weight of a polyamide;

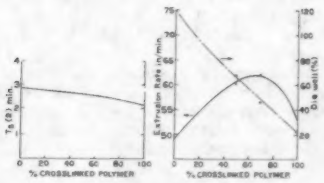
about 15 percent to about 44 percent by weight of an ionic copolymer of an alpha-olefin of the formula $RCH{=}CH_2$ where R is H or alkyl radicals having from 1 to 8 carbon atoms, and an alpha,beta-ethylenically unsaturated carboxylic acid having from 3 to 8 carbon atoms, the ionic copolymer having at least 10 percent of the carboxylic acid groups neutralized with metal ions; and

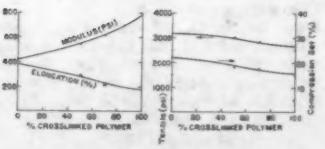
about 1 percent to about 12 percent by weight of an ester copolymer of ethylene and an ester selected from the group of alkyl esters of alpha,beta-ethylenically unsaturated carboxylic acids having 3 to 8 carbon atoms wherein the alkyl group contains 1 to 4 carbon atoms.

4,404,326
PRECROSSLINKED NITRILE RUBBER POLYMER BLENDS WITH LINEAR POLYMERS

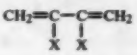
Daniel M. Chang, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 93,652, Nov. 13, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 204,111
Int. Cl.³ C08L *13/00*
U.S. Cl. 525—223 **6 Claims**

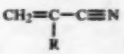




1. A polymer blend of a precrosslinked polymer and a linear polymer in a relative amount of from 5 to 95% precrosslinked polymer which blend can be coagulated to a free-flowing non-sticky powder, the precrosslinked polymer contains copolymerized therein a polyol polyacrylate derived from a polyol having 2 to 6 hydroxyl groups at least two of which are esterified to form an acrylate ester and is present in an amount sufficient to mildly precrosslink the precrosslinked polymer to the extent of improving compression set, faster extrusion rate, and lower die swell set without the expected sacrifice of modulus of elasticity, elongation, and tensile strength, the precrosslinked polymer consists essentially of at least 50% diene units with remainder being nitrile units, the diene units being derived from a diene monomer having the formula



where X is hydrogen, an alkyl radical of 1 to 5 carbon atoms, or an aryl radical, and the nitrile units being derived from a nitrile monomer having the formula



where R is hydrogen, a halogen, an alkyl radical of 1 to 8 carbon atoms, or an aryl radical; the linear polymer being defined same as the precrosslinked polymer but without the polyol polyacrylate.

4,404,327
ORTHOPAEDIC CEMENT FROM ACRYLATE POLYMERS

Aldo M. Crugnola, 51 Frederick St., Unit 85, Dracut, Mass. 01826, and Edward J. Ellis, 109 Jackman St., Georgetown, Mass. 01969

Continuation of Ser. No. 89,933, Oct. 31, 1979, abandoned. This application Mar. 1, 1982, Ser. No. 353,597
Int. Cl.³ C08L *33/12, 33/08*
U.S. Cl. 525—228 **10 Claims**

1. An improved orthopaedic cement comprising acrylate matrix polymer together with a powder formed of a second acrylate polymer which second polymer has a solubility parameter within about 0.2 units from the monomer from which said matrix polymer is formed, which has a glass transition temperature below human body temperature (37° C.) and which, at said human body temperature, is substantially more extensible than said matrix polymer:

said cement, when implanted in the human body, at body temperature being a composite material consisting of relatively rubbery polymer particles embedded in a rigid, glassy matrix of polymethyl methacrylate and having a setting time of about ten to fifteen minutes.

4,404,328

ORGANOMETALLIC POLYMER COMPOSITIONS USEFUL AS CONSTITUENTS OF ANTI-FOULING PAINTS FOR MARINE STRUCTURES AND THEIR METHODS OF MANUFACTURE

Francois Dawans, Bougival; Marguerite Devaud, Mont St. Aignan, and Denise Nicolas, Maurepas, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 935,822, Aug. 22, 1978, Pat. No. 4,262,097. This application Nov. 19, 1980, Ser. No. 208,462
Claims priority, application France, Aug. 22, 1977, 77 25771
The portion of the term of this patent subsequent to Apr. 14, 1998, has been disclaimed.
Int. Cl.³ C08F *253/00*
U.S. Cl. 525—274 13 Claims

1. An organometallic polymer composition, comprising a graft copolymer formed of:

(a) a main chain consisting of a chlorinated polymer of a conjungated diene monomer;

(b) at least one grafted chain formed at least partly of recurrent units having at least one pendant tin or organotin carboxylate function; and

(c) at least one grafted chain containing recurrent units derived from at least one hydrophilic non-metallic unsaturated organic monomer;

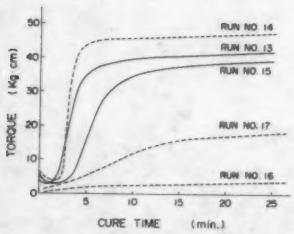
wherein said chlorinated polymer of a conjugated diene monomer has a chlorine content such that the final graft copolymer contains from 20 to 65% by weight of chlorine.

4,404,329

RUBBER COMPOSITION CAPABLE OF GIVING VULCANIZATES HAVING IMPROVED OZONE CRACKING RESISTANCE AND OIL RESISTANCE

Akio Maeda; Kinro Hashimoto; Shigelu Yagishita, all of Yokohama; Masaaki Inagami, Kamakura, and Hiroshi Fukushima, Zushi, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 26,358, Apr. 2, 1979, abandoned. This application Jun. 10, 1980, Ser. No. 158,249
Claims priority, application Japan, Apr. 6, 1978, 53-5339744
Int. Cl.³ C08C *19/22, 19/20*
U.S. Cl. 525—329.2 4 Claims



1. A method of preventing deterioration of vulcanizable rubber products which come into contact with sour gasoline which comprises forming said product from a sulfur-vulcanized rubber article comprising a sulfur-vulcanized, filled partially hydrogenated random copolymer composed of 10 to 50% by weight of an acrylonitrile unit, 25 to 88% by weight of a hydrogenated conjugated diene unit and 2 to 25% by weight of a conjugated diene unit, and allowing said sulfur-vulcanized rubber article to come into contact with sour gasoline.

4. A rubber product such as hose or tube in combination with an internal combustion engine which generates sour gasoline from gasoline, said rubber product coming into contact with the sour gasoline and being formed from a sulfur-vulcanized, filled partially hydrogenated random copolymer composed of 10 to 50% by weight of an acrylonitrile unit, 25 to 88% by weight of a hydrogenated conjugated diene unit and 2 to 25% by weight of a conjugated diene unit.

4,404,330

CURABLE RESIN COMPOSITION

Nobuyuki Ikeguchi, Tokyo, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 6, 1981, Ser. No. 260,993
Claims priority, application Japan, May 6, 1980, 55-59630; Jun. 9, 1980, 50-77384; Feb. 5, 1981, 56-16040; Mar. 19, 1981, 56-39831
Int. Cl.³ C08F *8/30*
U.S. Cl. 525—374 13 Claims

1. A curable resin composition comprising:

(a) at least one cyanate ester compound selected from the group consisting of:

(1) a polyfunctional aromatic cyanate ester monomer having the formula:

$$R\text{—}(O\text{—}C{\equiv}N)_m$$

wherein m is 2 to 5 and R is an aromatic organic group, the cyanate groups being bonded to an aromatic ring of said aromatic organic group,

(2) a prepolymer of (1), and

(3) a coprepolymer of (1) and an amine; and

(b) at least one polymeric material selected from the group consisting of:

(1) a terpolymer of acrylonitrile, butadiene, and isoprene,

(2) a copolymer of acrylonitrile and butadiene or isoprene,

(3) a reaction product of (1) or (2) and a compound selected from the group consisting of an isocyanate compound, an epoxy compound, an acrylate, a methacrylate and an unsaturated acid anhydride, and

(4) the product formed by modifying (1) or (2) by introducing a methacryloyl group, an acryloyl group or an acid anhydride moiety thereinto,

said composition including a mixture of components (a) and (b), a preliminary reaction product of components (a) and (b), or the combination of said mixture and said preliminary reaction product.

4,404,331

ENAMEL HAVING IMPROVED COATABILITY AND INSULATED ELECTRICAL ARTICLES PRODUCED THEREFROM

Denis R. Pauze, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 183,857, Sep. 3, 1980, abandoned. This application May 21, 1982, Ser. No. 380,589
Int. Cl.³ C08L *77/00*
U.S. Cl. 525—424 4 Claims

1. In an enamel composition consisting essentially of a curable polyesterimide resin dissolved in a solvent therefor, the improvement wherein said composition additionally contains an amount of nylon polymer sufficient to enhance surface coatability and smoothness.

4,404,332

CROSS-LINKING AGENTS FOR CATIONIC POLYMERS

Girish G. Parekh, Fairfield; Werner J. Blank, Wiltca, and Peter J. Schirmann, Fairfield, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 232,455, Feb. 9, 1981, abandoned, which is a continuation of Ser. No. 128,613, Mar. 10, 1980, abandoned, which is a division of Ser. No. 32,982, Apr. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 926,762, Jul. 21, 1978, abandoned. This application Oct. 26, 1982, Ser. No. 436,895
Int. Cl.³ C08G *12/32*
U.S. Cl. 525—428 6 Claims

1. A composition of matter comprising (A) a compound

having an average of at least two primary or secondary amine groups per molecule, and (B) a melamine compound, the amine groups of which contain as substituents an average of at least two glyoxylic acid ester groups per molecule.

4,404,333

THERMOPLASTIC POLYESTER RESIN, PRODUCTION OF SAME, AND ORTHOPEDIC CAST MATERIAL PRODUCED THEREFROM

Shoji Watanabe, Ohtake, and Michio Nakanishi, Niiza, both of Japan, assignors to Daicel Chemical Industries, Inc., Osaka, Japan

Filed Nov. 3, 1982, Ser. No. 438,954
Claims priority, application Japan, Nov. 6, 1981, 56-178808; Nov. 6, 1981, 56-178809
Int. Cl.³ C08F 283/00; C08G 63/76
U.S. Cl. 525—437 16 Claims

1. A thermoplastic polyester resin having the formula (I):

$$[A]_l[B]_m[C]_n \ldots \quad (I)$$

where A denotes a residue of straight or branched aliphatic dicarboxylic acid of carbon number 4 to 12 or 36; B denotes a residue of straight or branched aliphatic diol of carbon number 2 to 18; C denotes a residue of 6-hydroxycaproic acid; these residues are linked through the ester bond and distributed randomly and/or in block in the molecule; l, m, and n each has a value greater than 0; the residue of the 6-hydroxycaproic acid is 60 to 98 wt% and the sum of the residues of the aliphatic dicarboxylic acid and aliphatic diol is 40 to 2 wt%; and the residue of the aliphatic dicarboxylic acid and the residue of the aliphatic diol are contained in the equimolar amount; and having a number-average molecular weight of 5,000 to 200,000.

15. A process for the production of a thermoplastic polyester resin which comprises mixing (ii) a straight or branched aliphatic diol having 2–18 carbon atoms and (iii) a straight or branched aliphatic dicarboxylic acid having 4–12 or 36 carbon atoms, or anhydride or lower alkyl ester thereof; and subjecting the mixture in the presence of a catalyst for esterification to an esterification and condensation, to give a linear polyester resin having a number-average molecular weight of 2,000–100,000; and then reacting said polyester resin with (i) ϵ-caprolactone or 6-hydroxy-caproic acid in the presence of a catalyst for polymerization and ring opening.

4,404,334

THERMOSETTING RESINOUS POLYOL

Leopold F. Bornstein, Atlanta, Ga., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Nov. 18, 1982, Ser. No. 442,634
Int. Cl.³ C08G 8/24, 8/28, 8/04, 8/10
U.S. Cl. 525—504 11 Claims

1. A method for producing phenolic-aldehyde based resinous thermosetting polyol by

(a) co-reacting in a first reaction step at substantially atmospheric pressure, at a temperature between about 120° C. and 135° C. and under mildly acidic conditions a reaction mixture of:
  (i) primary phenolic component,
  (ii) substantially anhydrous aldehyde component, and
  (iii) polyhydroxyl component selected from the group consisting of: dihydric alcohols, polyhydric alcohols and salts of a lignosulfonic acid;
(b) continuing said co-reaction, while permitting volatile reaction constituents of the reaction mixture to evaporate freely therefrom, until the level of unreacted aldehyde component in the reaction mixture is below about 2.0 weight percent; and
(c) thereafter reacting in a second reaction step at substantially atmospheric pressure, and under mildly acidic conditions a secondary phenolic component with said first step resin product.

4,404,335

HYDROLYZING EPOXY RESINS IN ABSENCE OF SOLVENT AND IN PRESENCE OF OXALIC ACID AND A PHOSPHONIUM COMPOUND

Michael B. Cavitt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 16, 1982, Ser. No. 408,348
Int. Cl.³ C08G 59/14
U.S. Cl. 525—507 6 Claims

1. In a process for hydrolyzing epoxy resins by reacting one or more of said epoxy resins with water in the presence of a catalyst; the improvement which comprises conducting the reaction in the absence of substantial quantities of an organic solvent and in the presence of a catalytic quantity of a catalyst consisting essentially of (1) one or more dicarboxylic acids having from 2 to about 10 carbon atoms and (2) one or more phosphonium compounds wherein the molar ratio of (1) to (2) is from about 1:1 to about 20:1 respectively.

4,404,336

WATER SOLUBLE EPOXY ESTER COPOLYMERS FOR INTERIOR CAN USE

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 153,429, May 27, 1980, Pat. No. 4,294,737, which is a continuation-in-part of Ser. No. 108,283, Dec. 28, 1979, abandoned. This application Aug. 20, 1981, Ser. No. 294,743
Int. Cl.³ C08F 283/10; C08G 59/16
U.S. Cl. 525—531 11 Claims

1. Epoxy ester copolymer dispersible in water with the aid of an amine comprising a polyepoxide having a 1,2-epoxy equivalency in excess of 1.0 and a molecular weight of from 350 to 8000 esterified with at least about 0.5% of a monoester of a saturated monohydric alcohol with a monoethylenically unsaturated dicarboxylic acid which resists homopolymerization to produce a polyepoxide ester, said polyepoxide ester being copolymerized with from 15% to 70% of monoethylenic monomers including carboxy functional monomer providing an acid number of from 20–150 in the copolymer, all of said proportions being based on the final copolymer of said monomers with said polyepoxide ester.

4,404,337

PROCESS FOR INHIBITING THE FORMATION OF SCALE IN THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE

Akio Hata, and Michifumi Tanga, both of Shinnan'yo, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1981, Ser. No. 274,663
Claims priority, application Japan, Jun. 17, 1980, 55-82240
Int. Cl.³ C08F 14/06, 2/20
U.S. Cl. 526—62 5 Claims

1. In a process for suspension polymerizing vinyl chloride in which vinyl chloride or a mixture of vinyl chloride and a monomer or polymer copolymerizable therewith is dispersed in an aqueous medium in a polymerization vessel and polymerized in suspension in the presence of an oil-soluble polymerization initiator, the improvement which comprises applying a ternary reaction product of: (a) furfural; (b) a polyamine selected from the group consisting of ethylenediamine, a propylenediamine, trimethylenediamine, tetramethylenediamine, pentamethylenediamine, hexamethylenediamine, diethylenetriamine, tetraethylenepentamine, polyethyleneimine, cyclohexanediamine, phenylenediamine, toluenediamine, diaminophenylamine, N,N'-diphenylpropylenediamine and stilbendiamine; and (c) a phenol, the phenol being a benzene ring having at least one hydrogen atom on the benzene ring replaced by a hydroxy group, to the inner surfaces of the polymerization vessel in an amount of 0.0001 g/m² to 5 g/m² or adding the ternary reaction product to the polymerization

system in an amount of between 0.05 and 50 parts by weight per million parts of vinyl chloride monomer, whereby the formation of scale on the inner surfaces of the polymerization vessel is inhibited.

4,404,338

PROCESS FOR PREPARING COPOLYMERS OF VINYL-AROMATIC MONOMERS WITH ETHYLENICALLY UNSATURATED NITRILES HAVING LOW CONTENT OF UNREACTED RESIDUAL MONOMERS

Andrea De Toffol, Cerro Maggiore; Nicola Anfossi, Busto Arsizio, and Gianfranco Veroli, San Donato Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 1, 1981, Ser. No. 279,581
Claims priority, application Italy, Jul. 2, 1980, 23182 A/80
Int. Cl.³ C08F *212/10*
U.S. Cl. 526—86 **9 Claims**

1. A process for preparing copolymers of vinyl-aromatic monomers with ethylenically unsaturated nitriles as starting monomers, which copolymers have a very low content of unreacted residual monomers, said process comprising polymerizing the mixture of starting monomers in an aqueous dispersion and, when at least 70% of the starting monomers have been converted to polymer, adding from 0.2% to 2% by weight, referred to the starting monomers, of another, different monomer reactive towards the unreacted starting monomers and selected from the group consisting of vinyl acetate, esters of acrylic acid, esters of methacrylic acid, styrene, methacrylonitrile and mixtures thereof, the aqueous dispersion containing, at the time of the addition of the monomers reactive with unreacted starting monomers, from 0.1 to 0.5% by weight of a compound capable of yielding free radicals.

4,404,339

SUSPENSION POLYMERIZATION PROCESS FOR MAKING VINYL RESINS FOR USE IN PLASTISOLS

Charles N. Bush, Bay Village, and Thomas J. Doyle, Lorain, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 15, 1979, Ser. No. 84,479
Int. Cl.³ C08F *2/20*
U.S. Cl. 526—88 **13 Claims**

1. A suspension polymerization process for producing homopolymers of vinyl halides and vinylidene halides and copolymers thereof with one or more vinylidene monomers having at least one terminal $CH_2{=}C<$ grouping comprising, forming a monomer reaction mixture containing the monomer(s) to be polymerized, the aqueous reaction medium, a polyvinyl alcohol suspending agent, and from about 0.1% to about 1.5% by weight, based on the weight of the monomer(s), of a nonionic and substantially water-insoluble surfactant having a hydrophile-lipophile balance of less than about 3.5, agitating said reaction mixture to form suspended droplets of monomer in the mixture, heating said mixture to the polymerization temperature in the range of about 30° C. to about 70° C., agitating said mixture at said temperature for a period in the range of about 1 minute to about 60 minutes at about 100 to about 450 rpm., adding from about 0.01% to about 0.50% by weight, based on the weight of the monomer(s), of an oil-soluble free-radical yielding catalyst to said heated agitated reaction mixture and continuing said agitation at said rpm. for a period of about ½ to about 2 hours as the first stage, then reducing the rpm. to about 50 to about 300 rpm. as the second stage, said rpm. in the second stage being less than that in the first stage, thereby forming an aqueous slurry of dense, spherical and glassy polymer particles having a diameter in the range of about 10 to about 100 microns, and thereafter recovering said particles from said slurry.

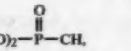
4,404,340

PROCESS FOR POLYMERIZING OLEFINS IN THE PRESENCE OF A TITANIUM-PHOSPHORUS-CHROMIUM CATALYST

Anthony N. Speca; Stanley J. Katzen, both of Cincinnati, and Louis J. Rekers, Wyoming, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 228,391, Jan. 26, 1981, Pat. No. 4,328,124. This application Dec. 24, 1982, Ser. No. 334,300
Int. Cl.³ C08F *4/02, 4/16, 4/24*
U.S. Cl. 526—97 **11 Claims**

1. A process for the polymerization of olefins which comprises contacting said olefin with a catalyst comprising an inorganic support material having deposited thereon the reaction product of (i) a trialkyl-dialkyl phosphato-titanate prepared from the reaction of $Ti(OR')_4$ and



wherein R and R′ are the same or different and are alkyl of from 1 to 6 carbon atoms, and (ii) chromium trioxide and heat activated in a non-reducing atmosphere at a temperature of above about 300° C. up to the decomposition temperature of the support.

4,404,341

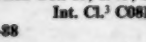
PROCESS FOR PRODUCING OLEFIN POLYMERS OR COPOLYMERS AND CATALYST THEREFOR

Yoshihisa Ushida, Ohtake; Akinori Toyota, and Norio Kashiwa, both of Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

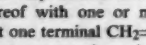
Filed Feb. 4, 1980, Ser. No. 118,325
Claims priority, application Japan, Feb. 6, 1979, 54-11823
Int. Cl.³ C08F *4/64, 10/04*
U.S. Cl. 526—125 **6 Claims**

1. In a process for producing an olefin polymer or copolymer having a high degree of stereoregularity by polymerizing an alpha-olefin having at least 3 carbon atoms or copolymerizing such alpha-olefins with each other or such an alpha-olefin with up to 20 mole% of ethylene and/or a diene in the presence of a catalyst formed from (1) a solid titanium catalyst component and (2) an organoaluminum compound, at a temperature of about 20° to about 200° C. and a pressure of from atmospheric pressure to about 50 kg/cm², under the copresence of hydrogen as molecular weight controller, the improvement comprising using as said catalyst

(A) the solid titanium catalyst component (1) containing magnesium, halogen, titanium, phosphorus and carboxylic acid ester wherein magnesium is derived from a magnesium compound selected from the group consisting of magnesium halides, magnesium alkoxyhalides, magnesium aryloxyhalides, magnesium alkoxides and magnesium aryloxides, and wherein said phosphorus is derived from a phosphorus compound selected from the group consisting of compounds of the following formulas:



and



wherein X is a halogen atom, each of R^1, R^2, R^3 and R^4 is selected from hydrocarbon groups having 1 to 20 carbon atoms and the halogen-substituted derivatives thereof, and R^1 and R^2 are identical or different and R^3 and R^4 are identical or different, $m+n+q=3$, $0 \leqq m \leqq 3$, $0 \leqq n \leqq 3$, $0 \leqq q \leqq 3$, $r+s+t=3$, $0 \leqq r \leqq 3$, $0 \leqq s \leqq 3$, and $0 \leqq t \leqq 3$;

and said carboxylic acid ester being an ester having from 2 to 40 carbon atoms;

wherein the molar ratio of phosphorus to carboxylic acid ester is from 0.05 to 2, the molar ratio of the carboxylic acid ester to titanium is from about 0.2 to about 10, the molar ratio of the magnesium to titanium is from about 3 to about 40, and the molar ratio of the halogen to titanium is from about 4 to about 100; said component (1) having a specific surface area of not less than about 40 m^2/g, said component (1) being prepared by intensively pulverizing the magnesium compound, the carboxylic acid ester and the phosphorus compound by mechanical means in the absence or presence of at least one member selected from the group consisting of titanium compounds, inert carriers and pulverization aids, and contacting the pulverized product with a tetravalent titanium compound which is in the liquid state under the treating conditions in the absence of mechanical pulverization:

(B) the organolauminum compound (2); and (C) an ester as an electron donor;

wherein (i) the proportion of component (C) in the polymerization or copolymerization is about 0.01 to about 1 mole per gram-atom of the aluminum atom in catalyst component (B) and (ii) the proportion of the aluminum atom in component (B) is about 1 to about 1000 moles per gram-atom of titanium in component (A) whereby the melt flow index of said olefin polymer or copolymer can be substantially varied without substantially decreasing the stereoregularity of said polymer or copolymer.

4,404,342

PROCESS FOR PREPARING A COPOLYMER

Mituji Miyoshi, Kanagawa; Kazuo Matsuura, Kawasaki, and Yoshio Tajima, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 122,985, Feb. 20, 1980, abandoned. This application Aug. 31, 1981, Ser. No. 297,959

Claims priority, application Japan, Feb. 27, 1979, 54-21445

Int. Cl.³ C08F 4/02, 210/02

U.S. Cl. 526—125 **13 Claims**

1. A process for preparing a low crystalline soft or semi-hard copolymer having a haze value of up to 30%, characterized in that 90 to 98 mole% of propylene, 0.2 to 5 mole% of ethylene and 0.2 to 5 mole% of a straight-chained α-olefin having from four to eighteen carbon atoms are copolymerized using a catalyst at a temperature in the range of from 20° to 300° C. and at a pressure in the range of from atmospheric pressure to 70 $Kg/Cm^2.G$, said catalyst comprising (1) a solid substance containing magnesium and titanium (2) an organometallic compound of Group I–IV of the Periodic Table and (3) at least 0.05 mole based on the amount of magnesium (gram atom) of an electron donor selected from the group consisting of ethers, ketones, organic acid esters, acid halides, and nitriles.

4,404,343

METHOD OF POLYMERIZING 1-OLEFINS

Raymond E. Hoff, Palatine, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Continuation of Ser. No. 95,469, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 65,219, Aug. 9, 1979, abandoned, which is a division of Ser. No. 912,874, Jun. 5, 1978, abandoned. This application Dec. 11, 1981, Ser. No. 329,967

Int. Cl.³ C08F 4/02, 10/00

U.S. Cl. 526—142 **10 Claims**

1. A method of making polymers of one or more 1-olefins which comprises polymerizing said olefins under polymerizing conditions with a supported olefin polymerization and copolymerization catalyst active in the presence of an organometallic co-catalyst, said catalyst being prepared by the method which comprises the consecutive steps of:

(a) mixing a solvent, a lower alkyl aluminum halide, a dialkyl magnesium compound and a particulate organic polymer, said organic polymer comprising a graft copolymer of high density polyethylene which has chemically bonded to it up to about 5 weight percent of X-methyl bicyclo [2.2.1]hept-5-ene-2,3-dicarboxylic acid anhydride;

(b) adding a reducible, reactive titanium compound of the formula $Ti(OR)_4$, where R is an alkyl group, to the mixture of said solvent, said alkyl aluminum halide, said dialkyl magnesium compound and said organic polymer, to form a reaction product, regulating the respective quantities of said alkyl aluminum halide, said dialkyl magnesium compound, said titanium compound and said organic polymer such that said reaction product comprises less than about 30 percent of the total weight of said reaction product and said organic polymer particles; and,

(c) evaporating said solvent at a temperature which is less than the softening temperature of said organic polymer.

4,404,344

PREPARING ETHYLENE POLYMERS USING ZIEGLER CATALYST COMPRISING CYCLODIENYL COMPOUND OF ZIRCONIUM

Hansjörg W. Sinn, Hamburg; Walter O. Kaminsky, Pinneberg; Hans-Jürgen C. Vollmer, Hamburg, and Rüdiger O. H. H. Woldt, Lüneberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,955

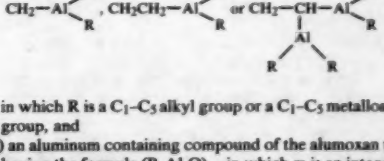
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007725

Int. Cl.³ C08F 4/64

U.S. Cl. 526—160 **17 Claims**

1. A process for preparing polymers of ethylene and propylene and of copolymers of ethylene and alpha olefins or alpha omega dienes, respectively by polymerizing the monomer(s) within a temperature range from −80° to 150° C. in the presence of a halogen free Ziegler type catalyst system consisting of a cyclopentadienyl compound containing zirconium and of an aluminum alkyl compound, characterized in that polymerization is made in the presence of catalyst system consisting of the following components:

(1) a compound containing zirconium and having the general formula $(cyclopentadienyl)_nMeY_n$, in which n is an integer from 1 to 4, Me is zirconium and Y is selected from the group consisting of hydrogen, a C_1–C_5 alkyl group or C_1–C_5 metal alkyl group or of a group of the following formula



in which R is a C_1–C_5 alkyl group or a C_1–C_5 metalloalkyl group, and

(2) an aluminum containing compound of the alumoxan type having the formula $(R\text{-}Al\text{-}O)_m$, in which m is an integer of 1 to 20 and R is a C_1–C_5 alkyl group.

4,404,345

NOVEL ADHESIVE COMPOSITIONS

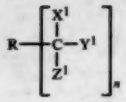
Edward W. Janssen, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 16, 1981, Ser. No. 302,781

Int. Cl.³ C08F 20/04

U.S. Cl. 526—206 **23 Claims**

1. An adhesive composition consisting of a first part and a second part which are contacted with one another when forming an adhesive bond between substrates using said adhesive composition, said first part consisting of (a) 100 parts by weight of a polymerizable monomer having at least one α,β-unsaturated carboxyl functionality; (b) about 0.05 to 20 parts by weight of an accelerator selected from the group consisting of compounds of the formula



wherein:

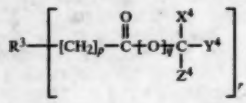
X^1 is selected from the group consisting of H, CH_3, Cl, and Br;

Y^1 and Z^1 are each selected independently from the group consisting of Cl and Br;

R^1 is selected from the group consisting of aromatic and heteroaromatic residues; and

n is an integer from 1 to 3 inclusive;

compounds of the formula



wherein:

X^4 is selected from the group consisting of H, Cl, Br and CN;

Y^4 and Z^4 are each selected independently from the group consisting of Cl and Br;

R^3 is selected from the group consisting of amino residues and organic radicals comprising 1 to about 10 carbons;

p is 0 or 1;

q is 0 or 1; and

r is 1 or 2;

1-trichloromethyl-cis-perhydropentalene and 1,1,1-trichloro-2-methyl-2-propanol hydrate; and (c) an inhibitor of free-radical polymerization; and said second part comprising a condensation reaction product of an aldehyde and a primary or secondary amine.

4,404,346

PRODUCTION OF POWDERED RESIN AND THE POWDERED RESIN SO PRODUCED

Marico G. Pirotta, and Giberto Garbagnati, both of Milan, Italy, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 5, 1980, Ser. No. 176,732

Int. Cl.³ B01J *41/08;* A31K *31/74*

U.S. Cl. 521—29 **10 Claims**

1. A process for comminuting particles of cholestyramine resins comprising the steps of

(a) inducing strain into the particles by changing their dimensions through contact with water or an organic solvent, and

(b) subsequently grinding the particles in a rotary attrition mill until the size of the particles is reduced such that at least 90% by weight and/or number of the particles are below 30 microns in diameter.

4,404,347

POLYISOCYANATE CROSS-LINKED POLYMERS CONTAINING CELLULOSIC COMPONENT

Toshiomi Nakamura, Daito; Masakazu Okamura, Suita; Yoichiro Moriguchi, Hirakata, and Tamiki Hayase, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 29, 1981, Ser. No. 335,476

Claims priority, application Japan, Jan. 9, 1981, 56-2268

Int. Cl.³ C08G *18/06, 18/28;* C08L *1/10*

U.S. Cl. 527—300 **23 Claims**

1. A cross-linked hybrid polymer comprising a first polymer block and a second polymer block cross-linked to each other via bonds to different reaction sites of a polyisocyanate compound, the bond of the first polymer block with the polyisocyanate compound being effected prior to the bond of the second polymer block thereto, said first polymer block being a film-forming cellulose derivative having at least one active hydrogen atom reactive with an isocyanato group of said polyisocyanate but not reactive with at least one remaining isocyanato group of said polyisocyanate, and said second polymer block being a preformed film-forming polymer having at least one active hydrogen atom which is reactive with said remaining isocyanato group of the polyisocyanate with which said active hydrogen atom of the cellulose derivative was unreactive, and said second film-forming polymer being an acrylic resin, an alkyd resin, a polyester resin, an epoxy resin, an aminoplast resin or a mixture of these resins; the ratio of the active hydrogen equivalent of said cellulose derivative to the isocyanate equivalent of said polyisocyanate being 1.0 to 200, and the ratio of the isocyanate equivalent of said polyisocyanate to the active hydrogen equivalent of said film-forming polymer being less than 1.0.

4,404,348

SOLVENTLESS ORGANOSILICON COATING/IMPREGNATING COMPOSITIONS

Alain Fau, Tassin la Demi-Lune, and Parasko Nicou, Francheville, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Aug. 10, 1982, Ser. No. 406,991

Claims priority, application France, Aug. 12, 1981, 81 15787

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—15 **16 Claims**

1. An organopolysiloxane composition comprising (i) an α,ω-dihydroxypolydiorganopolysiloxane having a viscosity, measured at 25° C., ranging from 5 to 100,000 mPa.s and consisting essentially of recurring units of the formula Z_2SiO, in which the symbols Z, which are identical or different, are alkyl or halogenoalkyl radicals having from 1 to 8 carbon atoms and containing from 1 to 7 chlorine and/or fluorine atoms, alkenyl radicals having from 2 to 4 carbon atoms, cycloalkyl or halogenocycloalkyl radicals having from 3 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms, aryl, alkylaryl and halogenoaryl radicals having from 6 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms, or cyanoalkyl radicals having from 3 to 4 carbon atoms; (ii) a polyorganopolysiloxane having from 1.60 to 1.90 organic radicals per silicon atom, having a viscosity ranging from 30 mPa.s at 25° C. to 3,000 mPa.s at 25° C., having from 0.2 to 10% of hydroxyl groups and consisting essentially of the recurring units $RSiO_{1.5}$, R_2SiO and $R_3SiO_{0.5}$, in which the symbols R, which are identical or different, are alkyl or halogenoalkyl radicals having from 1 to 8 carbon atoms and containing from 1 to 7 chlorine and/or fluorine atoms, alkenyl radicals having from 2 to 4 carbon atoms, cycloalkyl or halogenocycloalkyl radicals having from 3 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms, aryl, alkylaryl and halogenoaryl radicals having from 6 to 8 carbon atoms and containing from 1 to 4 chlorine and/or fluorine atoms, or cyanoalkyl radicals having from 3 to 4 carbon atoms; (iii) a crosslinking agent containing a polyalkoxysilyl group; and (iv) a catalytically effective amount of an organic iron or zirconium catalyst soluble in the organopolysiloxane medium.

4,404,349
POLYSILOXANES HAVING COMBINED THEREIN ORGANO TITANATES

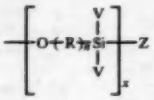
Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 192,319, Sep. 30, 1980, Pat. No. 4,328,323, which is a continuation-in-part of Ser. No. 70,785, Aug. 29, 1979, Pat. No. 4,291,136, which is a continuation-in-part of Ser. No. 892,153, Mar. 31, 1978, abandoned. This application Dec. 23, 1981, Ser. No. 334,046

Int. Cl.³ C08G 77/06, 77/18

U.S. Cl. 528—25 **21 Claims**

1. A polysiloxane, reactive with alkylene-alkyl acrylate copolymer, containing the repeating unit:



wherein R is a hydrocarbon radical or an oxy substituted hydrocarbon radical, each V is hydrogen, a hydrocarbon radical or a hydrolyzable group, Z is a hydrolyzable group, n is an integer having a value of 1 to 18 inclusive and x is an integer having a value of at least 2, said polysiloxane end blocked by an ester group and containing an organo titanate chemically combined therewith.

4,404,350
SILICONE-IMIDE COPOLYMERS AND METHOD FOR MAKING

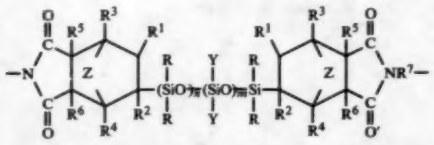
Hong-Son Ryang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 7, 1982, Ser. No. 395,933

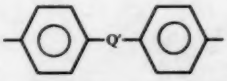
Int. Cl.³ C08G 77/04

U.S. Cl. 528—26 **11 Claims**

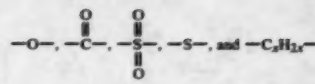
1. Silicone-imide copolymers comprising norbornane terminated polydiorganosiloxane groups of the formula



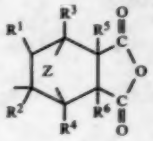
where R is selected from the group consisting of $C_{(1-13)}$ monovalent hydrocarbon radicals and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, R^1–R^6 are selected from the group consisting of hydrogen, halogen and the same or different $C_{(1-13)}$ monovalent hydrocarbon radicals and substituted $C_{(1-13)}$ monovalent hydrocarbon radicals, R^7 is a divalent $C_{(2-20)}$ organic radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (c) divalent radicals included by the formula,



Q' is a member selected from the class consisting of



x is a whole number from 1 to 5 inclusive, Z is a divalent radical selected from —O— and $—C(R^1)_2—$, Y is a radical selected from R and



n is an integer equal to 0 to 2000 inclusive, m is a whole number equal to 0 to 500, and the sum of n+m is equal to 0 to 2000 inclusive.

4,404,351
PROCESS FOR THE ISOLATION OF POLYCARBONATES BASED ON 4,4'-DIHYDROXYDIPHENYL SULPHONES

Peter Käfer, Krefeld; Leo Morbitzer, Cologne; Dieter Neuray, Krefeld; Wolfgang Cohnen, Leverkusen, and Werner Nouvertne, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

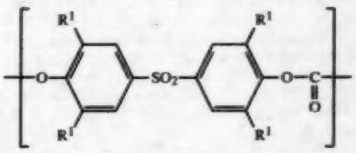
Filed Sep. 20, 1982, Ser. No. 420,438

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138179

Int. Cl.³ C08G 63/62

U.S. Cl. 528—174 **6 Claims**

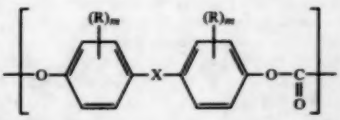
1. A process for the isolation of a polycarbonate containing 18 to 45 mol % of structural units of the general formula



(Ia)

in which

R^1 denotes a hydrogen atom or a C_1 to C_3 alkyl group, relative to the sum of polycarbonate structural units of the formula (I)+(Ia) in a polycarbonate of the general formula



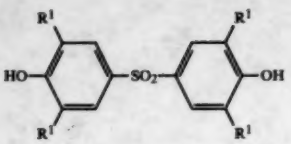
in which

X denotes a direct bond, a C_1 to C_8 alkylene, C_2 to C_8 alkylidene, cyclohexylene or cyclohexylidene radical, S, O or CO,

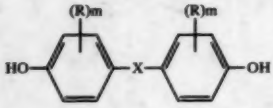
each R independently denotes a hydrogen, chlorine or bromine atom or an alkyl group having 1 to 3 carbon atoms, and

m is 0, 1 or 2,

comprising reacting, by the phase-boundary process, 18 to 45 mol % of a sulphone-bisphenol of the general formula


(IIa)

in which R^1 has the meaning given above, with 82 to 55 mol % of a bisphenol of the general formula


(II)

in which X, R and m have the meanings given above, said mol percentages in each case being relative to the total molar amount of the bisphenols of formula (IIA)+(II) used, in which reaction the bisphenol of the formula (II) is phosgenated to give an oligocarbonate containing chloroformic acid ester end groups and the oligocarbonate is then subjected to a polycondensation reaction with the sulphone-bisphenols of the formula (IIa) using an amine catalyst, separation of the phases in a separating vessel after the polycondensation has ended, and washing of the organic phase with phosphoric acid and water until the washings are neutral, and after further separation of the phases, isolation of the sulphone-bisphenol polycarbonate by precipitation or evaporation of the organic solvent.

4,404,352

METHOD OF PRODUCING POLYURETHANES

Koreyoshi Suenobu, Buzen; Masanori Kohara, Nakatsu; Yasuhiro Hidaka, Sakai; Kazuki Katsuyama, Nara, and Ryoichi Kinishi, Yoshitomimachi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP81/00393, § 371 Date Aug. 4, 1982, § 102(e) Date Aug. 4, 1982, PCT Pub. No. WO82/02203, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 17, 1981, Ser. No. 405,959

Claims priority, application Japan, Dec. 22, 1980, 55-182374; Apr. 17, 1981, 56-58963; Jul. 14, 1981, 56-110595; Jul. 17, 1981, 56-112565

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 12 Claims

1. A method of producing polyurethanes which comprises reacting an at least partially blocked isocyanate compound with an active hydrogen-containing compound in the presence of at least one compound selected from the group consisting of dialkyltin, diaryltin, monoalkyltin and monoaryltin compounds, and at least one amine compound selected from the group consisting of 1,10-phenanthroline, bipyridyl, 4,4'-dimethyl-2,2'-bipyridyl, 2,4,6-tris(dimethylaminomethyl)-phenol, a morpholine compound, a piperidine compound and an alkanolamine compound of the formula

$$(R)_{3-n}N(CH_2CH_2OH)_n$$

wherein R is a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a phenyl group or a group of the formula $-(CH_2)_mNH_2$ in which m is an integer of 1 to 8, and n is an integer of 1 to 3 and wherein, when n is an integer of 1, the two Rs may be the same or different.

4,404,353

URETHANE ELASTOMER FOR PRINTING BELTS AND PROCESS THEREFOR

Edwin C. Siegel, Simi Valley, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Aug. 20, 1981, Ser. No. 294,716

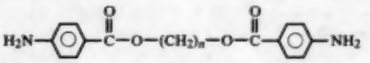
Int. Cl.³ C08G *18/42, 18/76, 18/32*

U.S. Cl. 528—67 20 Claims

1. A process for making a urethane elastomer comprising the steps of:

reacting a mixture of approximately 1.5 to 2.5 equivalents of toluene diisocyanate consisting essentially of approximately 84 wt.% to 96 wt.% 2,4 toluene diisocyanate and 16 wt.% to 4 wt.% 2,6 toluene diisocyanate, with approximately 1 equivalent of a member selected from the group consisting of polyethers having difunctional primary hydroxyl groups, saturated difunctional primary hydroxyl polyesters, and mixtures thereof, to form a urethane prepolymer, said member having a molecular weight selected such that the molecular weight of the resulting urethane prepolymer is between about 500 and 4,000; and

reacting approximately 1 equivalent of said prepolymer with approximately 1 equivalent of a diamine curing agent having the formula:



where n=2 through 6.

4,404,354

POLYPHENYLENE-TYPE POLYMERIC COMPOUND AND PROCESS FOR PRODUCTION THEREOF

Taku Kitamura, Tokyo, Japan, assignor to Dainippon Ink and Chemicals, Inc., Tokyo and Kawamura Institute of Chemical Research, Saitama, both of, Japan

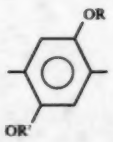
Filed Dec. 28, 1982, Ser. No. 453,837

Claims priority, application Japan, Dec. 28, 1981, 56-209655; Feb. 25, 1982, 57-29163; Mar. 29, 1982, 57-49004

Int. Cl.³ C08G *61/02, 61/12*

U.S. Cl. 528—86 10 Claims

1. A poly(dialkoxyphenylene) composed of recurring structural units of the general formula



wherein R and R′ each represent an alkyl group having 1 to 4 carbon atoms, and R and R′ may be identical or different, but in no case R and R′ are both methyl groups.

4,404,355

HEAT CURABLE EPOXY RESIN COMPOSITIONS

Sameer H. Eldin, Birsfelden, and Bruno Schreiber, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 28, 1981, Ser. No. 305,829

Claims priority, application Switzerland, Oct. 8, 1980, 7509/80

Int. Cl.³ C08G *59/68*

U.S. Cl. 528—89 9 Claims

1. A heat curable epoxy resin composition which contains

(a) an epoxy compound or an epoxy resin containing on average more than one epoxide group per molecule,

(b) a catalytic amount of an aromatic onium salt,

(c) a catalytic amount of an organic copper compound, wherein the copper is complexed, as co-catalyst, and
(d) from 0.05 to 2 parts, based on 100 parts of epoxy resin, of a light stabilizer selected from the group consisting of the 2-hydroxybenzophenones, the 2-hydroxyphenylbenzotriazoles, 2,4-dibenzoylresorcinol, the arylsubstituted acrylates and the salicylates.

4,404,356

HEAT-CURABLE EPOXIDE RESIN COMPOSITIONS

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

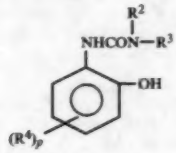
Filed Aug. 30, 1982, Ser. No. 412,740

Claims priority, application United Kingdom, Sep. 9, 1981, 8127233; Dec. 11, 1981, 8137555

Int. Cl.³ C08G *59/44, 59/46*

U.S. Cl. 528—99 **9 Claims**

1. Heat-curable compositions comprising
(a) an epoxide resin and
(b) an effective amount of a urea of formula



V

where
R^2 and R^3 each denote an alkyl, cycloalkyl, alkenyl, cycloalkenyl, or aralkyl group, which may be substituted by a halogen atom, a hydroxyl group, or a cyano group, with the proviso that R^2 may alternatively denote a hydrogen atom, or R^2 and R^3 together with the attached nitrogen atom denote a heterocyclic ring containing 3 to 5 carbon atoms, and optionally one oxygen atom, in the ring,
R^4 denotes—NH_2, —NO_2, —Cl, —Br, or alkyl of 1 to 10 carbon atoms, and
p denotes zero, 1, or 2.

4,404,357

HIGH TEMPERATURE NAPHTHOL NOVOLAK RESIN

Paul Taylor, No. Andover, and Michael Gulla, Sherborn, both of Mass., assignors to Shipley Company Inc., Newton, Mass.

Filed May 3, 1982, Ser. No. 374,054

Int. Cl.³ C08G *8/24*

U.S. Cl. 528—153 **10 Claims**

1. A resin comprising the product resulting from the condensation of an aldehyde and an aromatic alcohol mixture in the presence of an acid catalyst, said aromatic alcohol mixture comprising from 5 to 95 mole percent of a naphthol and from 95 to 5 mole percent of a phenol that is not a naphthol, said aromatic alcohol mixture being in molar excess of said aldehyde.

4,404,358

RESOLE COMPOSITIONS AND LAMINATES MADE THEREFROM

Bruce Q. Ballert, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 962,024, Nov. 20, 1978, abandoned. This application Oct. 30, 1980, Ser. No. 202,310

Int. Cl.³ C08G *8/32*

U.S. Cl. 528—158.5 **9 Claims**

1. In the process of preparing an oil modified resole laminating varnish by (a) reacting a phenol moiety with a drying oil in the presence of a strong acid, (b) reacting the product of (a) in an alcohol solvent with an aldehyde moiety in the presence of an amine catalyst and (c) adding a solvent, the improvement which consists of using a drying oil comprising (i) about 1 part by weight of linseed oil and (ii) about 1 part by weight of tung oil.

4,404,359

PREPARATION OF POLYPHENYLENE ETHERS

Herbert Naarmann, Wattenheim; Juergen Hambrecht, Heidelberg, and Norbert Rieber, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,211

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129083

Int. Cl.³ C08G *65/44*

U.S. Cl. 528—216 **2 Claims**

1. A process for the preparation of a high molecular weight polyphenylene ether from a monohydric phenol which has alkyl substituents in both ortho-positions and may additionally have an alkyl substituent in one meta-position but not in the para-position, by an oxidative coupling reaction, employing oxygen, at from 10° to 25° C., in the presence of a catalyst complex comprising a copper salt and an organic amine, in the presence of from 1 to 20 parts by weight of an aromatic C_8-C_{10}-hydrocarbon solvent per part by weight of the monomeric phenol, and in the presence or absence of an activator, wherein the amine used is N-methylimidazole, N-ethylimidazole, N-isopropylimidazole, N-n-butylimidazole, N-cyclohexylimidazole, N-octylimidazole or N-phenylimidazole.

4,404,360

HOMOGENEOUS MOLDED ARTICLE PRODUCED FROM POLYLACTAM BY ACTIVATED ANIONIC POLYMERIZATION OF MEDIUM LACTAMS

Werner Hartmann, Immenstaad, Fed. Rep. of Germany, assignor to Harwe AG, Zurich, Switzerland

Filed Nov. 2, 1981, Ser. No. 317,119

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ C08G *69/14, 69/18*

U.S. Cl. 528—326 **1 Claim**

1. A homogenous molded polylactam article formed of a lactam containing 13 to 15 carbon atoms in the lactam ring which are free of bubble formations and shrink holes and which does not show a melting point and crumbles after hardening when heated to a temperature from approximately 220° C. to 280° C. prepared by a process involving activated anionic polymerization and which comprises:
(a) adding to a first melt of the lactam contained in a first vessel at least one polymerization catalyst for the lactam with agitation and maintaining the mixture of the lactam melt and added catalyst under agitation and protected by an inery gas at a first temperature in the range from about 167.5° C. and about 169.5° C., and at a temperature deviation tolerance of about ±1° C. for said first temperature;
(b) adding, following the addition of the catalyst to the first melt of the lactam, at least one activator for the polymerization of the lactam to a second melt of the lactam under agitation and maintaining the mixture of the second melt of the lactam and activator stirred and protected by an inert gas at a second temperature which is lower than the temperature of the first mel and within a temperature range of from about 164° C. and about 166° C., and at a temperature deviation tolerance of about ±1° C. for said second temperature;
(c) pumping the first melt and second melt at about the melt temperatures by respective first and second gear pumps to a mixing zone through respective first and second essentially straight conveyor tube systems, each respectively at substantially the same temperature as said first and second melts and having an angle of incline to the horizontal plane of a maximum of about 10°, each conveyor tube having a volume at least one-third greater than the

volume-conveying capacity of the gear pump to which said tube is coupled;

(d) combining and mixing the melts in a mixing zone maintained between about 170° C. and about 175° C. to initiate a polumerization reaction;

(e) injecting the melt from the mixing zone into a mold for the molded article to form the article with attendant release of gas; and

(f) returning at least part of the released gas to at least one of the mixing vessels by the conveyor tube systems.

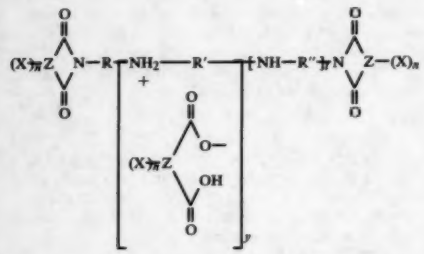
4,404,361

FLAME RETARDANT FOR POLYMERIC COMPOSITIONS

Henry J. Barda, North Brunswick, N.J., assignor to Saytech, Inc., Sayreville, N.J.

Filed Jan. 11, 1982, Ser. No. 338,531
Int. Cl.³ C07D 403/12; C08G 73/06
U.S. Cl. 528—342 **13 Claims**

1. An additive flame retardant halogen-containing bisimide having the formula:



wherein Z is a hydrocarbon group having the valence n+2 and is selected from the group consisting of benzene groups, naphthalene groups and alicyclic hydrocarbon groups containing 5–10 carbon atoms, X is selected from the group consisting of bromine and chlorine, n is an integer from 1–6, R, R′ and R″ are divalent hydrocarbon groups independently selected from the group consisting of aliphatic hydrocarbon groups and alicyclic hydrocarbon groups containing 2–12 carbon atoms, y is an integer from 1–50 and t is an integer from 0–49.

4,404,362

BLOCK POLYMERS OF ALKANOLAMINES

Thomas J. Bellos, Kirkwood, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 14, 1981, Ser. No. 330,118
Int. Cl.³ C08G 73/02
U.S. Cl. 528—422 **19 Claims**

1. Block polymers of polyalkanolamines, wherein each block is a different alkanolamine dehydration condensation product.

4,404,363

SEPARATION OF DIPHASIC MIXTURES CONTAINING AROMATIC POLYESTERS

Dieter Freitag; Volker Serini, both of Krefeld; John Goossens, Cologne; Ludwig Bottenbruch, Krefeld, and Uwe Hucks, Alpen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 26, 1982, Ser. No. 371,532
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117367
Int. Cl.³ C08G 63/74
U.S. Cl. 528—486 **10 Claims**

1. A process for the separation of diphasic mixtures obtained from the synthesis of aromatic polyesters by the diphasic interface process into an aqueous and an organic phase, characterised in that the following are added to the diphasic mixture which is required to be separated:

A. 10–10,000 ppm, based on the weight of the aqueous phase, of at least one ammonium compound containing at least one quaternary nitrogen atom per molecule, which nitrogen atom carries as substituents one or two long-chained hydrocarbon groups having 6–40 C-atoms and two or three short-chained hydrocarbon groups having less than 6 C-atoms,

and in which two short-chained hydrocarbon groups together with the nitrogen atom may form an imidazolinyl, pyridyl or oxazolinyl group, and/or,

the long-chained hydrocarbon groups may be interrupted by 1–2 sulphonyl amino groups (—SO_2NH—) and, where more than one quaternary nitrogen atom is present, the nitrogen atoms may be linked by a hydroxyalkylene group, or

B. 0.1–1,000 ppm, based on the weight of the aqueous phase, of at least one water-soluble anionic organic polymer having an average molecular weight M_w of 2,000–5,000,000 and carboxyl, sulpho, acid phosphate or acid sulphate groups and/or their water-soluble salts corresponding to a charge density of from 0.0005–0.02.

4,404,364

OPTIMUM METHOD OF MILLING RUBBER

William C. Lang, Kent, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 173,940, Jul. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 103,128, Dec. 13, 1979, abandoned, which is a continuation of Ser. No. 971,977, Dec. 21, 1978, abandoned, which is a continuation of Ser. No. 871,291, Jan. 23, 1978, abandoned. This application Apr. 23, 1982, Ser. No. 371,346
Int. Cl.³ C08F 6/00
U.S. Cl. 528—502 **1 Claim**

1. An energy efficient method of compounding a rubber stock on the rolls of an internally cooled rubber mill in a compounding zone on said mill comprising (1) optimizing the cooling water flow rate by varying the flow rate from 0.0159 m^3 water/m^2/min. of internal mill surface area per minute to 0.1233 m^3/m^2/min. (or 0.0111 m^3/m^2/min. of external mill surface area to 0.0855 m^3/m^2/min.) at a temperature above 20° C. to establish the flow rate at which further increases in water flow rate do not significantly decrease the difference between the stock temperature and the cooling water at constant temperature with stock temperature in the range of 74° C. (165° F.) to 121° C. (250° F.), (2) then increasing the temperature of the cooling water at said optimum constant flow rate at one or more additional different fixed temperatures of at least 20° C. to establish the temperature at which further increases in temperature do not materially descrease the differential between the stock temperature and the cooling water temperature and to obtain an optimum cooling water temperature with a stock temperature in the range of 74° C. to 121° C. and (3) operating said mill at said optimum cooling water flow rate and said optimum cooling water temperature to compound said stock at a temperature of the stock below the scorch temperature of the stock in the range of 74° C. to 121° C. and to conserve energy, said water being in turbulent flow.

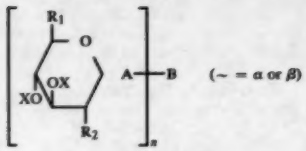
4,404,365

MODULATORS OF THE COMPLEMENT SYSTEM

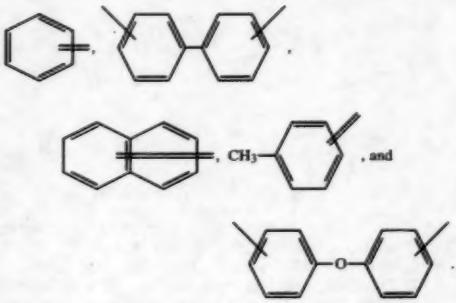
Thomas G. Miner, Sugarloaf, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,938
Int. Cl.³ C07H 15/00
U.S. Cl. 536—4.1 **7 Claims**

1. A compound selected from those of the formula:



wherein X is —SO_3M and M is a nontoxic pharmaceutically acceptable cation salt, wherein the salt forming moiety is selected from the group consisting of alkali metal, alkaline earth metal, ammonia and substituted ammonia selected from the group consisting of trialkylamine (C_1–C_6), piperidine, pyrazine, alkanolamine (C_2–C_6) and cycloalkylamine (C_3–C_6); R_1 is selected from the group consisting of CH_2OX, COOH and COONa; R_2 is selected from the group consisting of OX and $NHCOCH_3$; A is selected from the group consisting of S, SO, and SO_2; n is an integer 2; and B is an arylene selected from the group consisting of:



4,404,366

BETA-GALACTOSYL-UMBELLIFERONE-LABELED HAPTEN CONJUGATES

Robert C. Boguslaski; John F. Burd, and Robert J. Carrico, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

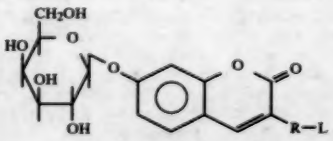
Division of Ser. No. 147,339, May 6, 1980, Pat. No. 4,331,590, which is a division of Ser. No. 87,819, Oct. 23, 1979, Pat. No. 4,279,992, which is a continuation-in-part of Ser. No. 886,094, Mar. 13, 1978, Pat. No. 4,226,978. This application Jul. 16, 1981, Ser. No. 284,137

The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.

Int. Cl.³ C07H *15/24*

U.S. Cl. 536—18.1 **11 Claims**

9. A β-galactosyl-umbelliferone-labeled hapten conjugate of the formula:



wherein R is a linking group and L is a hapten of molecular weight between 100 and 1000.

4,404,367

GLUCOSUBSTITUENTED DITERPENOID SWEETENERS

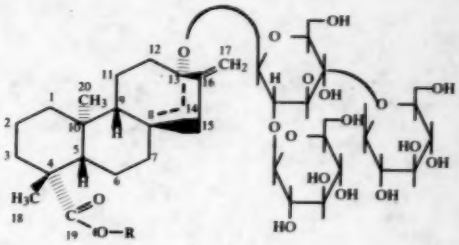
Rebecca A. G. Stephenson, Redwood City; Paul S. Dietrich, Mountain View; Grant E. DuBois, Palo Alto, and Leonard A. Bunes, San Carlos, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Aug. 26, 1981, Ser. No. 296,566

Int. Cl.³ C07H *15/24*; A23L *1/236*

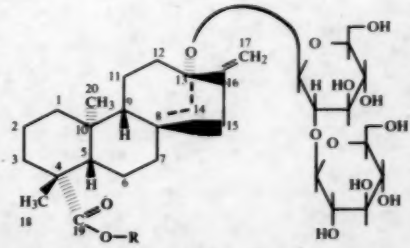
U.S. Cl. 536—18.1 **24 Claims**

1. A rebaudioside C analog compound based on the structure



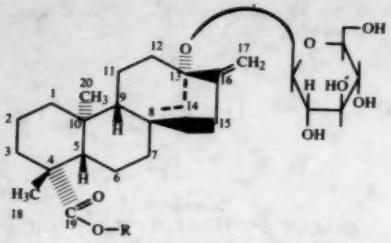
wherein R is hydrogen or a physiologically acceptable noncarbohydrate α-carbon oxygen free 1 to 10 carbon atom polar organic group and each of the glucose rings has at least one of its OH units substituented to OR′ wherein R′ is a covalently bound physiologically acceptable noncarbohydrate polar organic group.

9. A steviolbioside analog compound based on the structure



wherein R is hydrogen or a physiologically acceptable noncarbohydrate α-carbon oxygen free 1 to 10 carbon atom polar organic group and each of the glucose rings has at least one of its OH units substituented to OR′ wherein R′ is a covalently bound physiologically acceptable noncarbohydrate polar organic group.

17. A steviolmonoside analog compound based on the structure



wherein R is hydrogen or a physiologically acceptable noncarbohydrate α-carbon oxygen free 1 to 10 carbon atom polar organic group and the glucose ring has at least one of its OH units substituented to OR' wherein R' is a covalently bound physiologically acceptable noncarbohydrate polar organic group.

4,404,368

LYOPHILIZED PHOSPHORYLATED NUCLEOSIDES

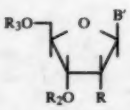
Gabriel G. Alvarado-Urbina, 5c, Banner Rd., Nepean, Ontario, Canada (K2H 8T3), and Kelvin K. Ogilvie, 54, Place de Bretagne, Candian, Quebec, Canada (J5R 3M8)

Filed Feb. 17, 1981, Ser. No. 234,788

Int. Cl.³ C07H *19/20, 19/10*

U.S. Cl. 536—27 **5 Claims**

1. A process for preparing lyophilized phosphorylated nucleotides of general formula 1



I

where R is hydrogen, oxy-lower alkyl, oxyphenyl, oxybenzyl, oxysilyl, oxy-lower alkylsilyl, oxytrityl, oxy-loweralkoxytrityl or a halophosphite group

II

in which

X is fluorine, chlorine, bromine or iodine and R_1 is a chemical protecting group for hydroxyl and selected from lower alkyl, phenyl, benzyl, silyl, lower alkylsilyl, trityl and lower-alkoxytrityl;

R_2 and R_3 are independently selected from hydrogen, lower alkyl, phenyl, benzyl, silyl, lower alkyl silyl, trityl, lower-alkoxytrityl and halophosphite group $R_1O—P—X$ with the proviso that one of R, R_2 and R_3 is a halophosphite group;

B' is a base selected from guanine, adenine, uracil, cytosine and thymine;

which comprises forming a solution of said nucleotide in dioxane solvent, subjecting the solution to low pressure conditions to cause sublimation of the dioxane solvent, and recovering lyophilized nucleotide compound of formula 1 in light, divided form, readily soluble in pyridine at room temperatures.

4,404,369

METHOD OF PRODUCING ALKALI-SOLUBLE CELLULOSE DERIVATIVE

Jouko Huttunen; Olli Turunen; Leo Mandell; Vidar Eklund, and Kurt Ekman, all of Porvoo, Finland, assignors to Neste OY, Finland

Filed Jan. 20, 1982, Ser. No. 341,133

Claims priority, application Finland, Jan. 27, 1981, 810226

Int. Cl.³ C08B *15/06*

U.S. Cl. 536—30 **8 Claims**

1. Method of producing alkali-soluble cellulose carbamate, which comprises treating cellulose with a solution consisting essentially of liquid ammonia having urea dissolved therein at a temperature below the temperature of reaction between cellulose and urea, to cause distribution of the urea throughout the cellulose, removing the ammonia at a temperature below the temperature of reaction between cellulose and urea, thereby obtaining cellulose having urea distributed therethrough, and heating the thus obtained cellulose with urea distributed therethrough to a temperature sufficiently high to cause reaction between the cellulose and the urea, thus obtaining an alkali-soluble cellulose carbamate.

4,404,370

PURIFICATION OF CELLULOSE AND STARCH ETHERS WITH COUNTER CURRENT WASHING

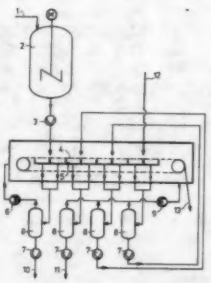
Claus-Rüdiger Bernert, Walsrode; Volker Hartwig, Fallingbostel; Christian Kords, Walsrode, and Detmar Redeker, Cologne, all of Fed. Rep. of Germany, assignors to Wolff Walsrode AG and Bayer AG, Leverkusen, Fed. Rep. of Germany

Filed Nov. 23, 1980, Ser. No. 323,576

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044696

Int. Cl.³ C08B *11/20, 31/08*

U.S. Cl. 536—85 **6 Claims**



1. A process for the continuous purification and isolation of a cellulose or starch ether suspension which comprises filtering off the suspension agent, extracting the reaction product with a purifying agent different from the suspension agent and drying it under suction, wherein directly after the etherification step without any intermediate drying and the preparation of pastes the suspension agent is filtered off and the reaction product is extracted in countercurrent with the purifying agent at least once on the same continuously working filter.

4,404,371

CARBOXYMETHYLCELLULOSE WITH CARBONATE BRIDGES AND PREPARATION THEREOF

Günter Bellmann, Commugny; Celeste Cervini, Carouge, both of Switzerland, and Jean-Pierre Sachetto, Saint-Julien en Genevois, France, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Dec. 28, 1981, Ser. No. 334,590

Claims priority, application Switzerland, Jan. 14, 1981, 202/81

Int. Cl.³ C08G 59/00

U.S. Cl. 536—98 9 Claims

1. Cross-linked carboxymethylcellulose (CMC) having cross-linking intermolecular bridges consisting mainly of carbonate bridges involving the primary or secondary hydroxy functions of the CMC chains.

4,404,372

15-SUBSTITUTED-ω-PENTANORPROSTAGLANDIN DERIVATIVES

Michael R. Johnson, Gales Ferry; Thomas K. Schaaf, and Hans-Jurgen E. Hess, both of Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,879

Int. Cl.³ C07C 333/38, 143/76

U.S. Cl. 542—429 1 Claim

1. N-Methanesulfonyl-16,16-dimethyl-17-(2-furyl)-ω-trisnorprostaglandin E_2.

4,404,373

PROCESS FOR THE PREPARATION OF 7α-METHOXY-7β-(1,3-DIETHIETANE-2-CARBOXAMIDO)CEPHALOSPORANIC ACID DERIVATIVES

Masaru Iwanami, Yokohama; Tetsuya Maeda, Urawa; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Noriaki Nagano, Ageo, and Atsuki Yamazaki, Ichikawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

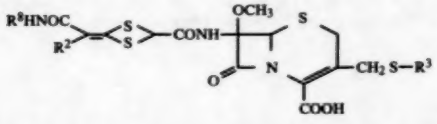
Division of Ser. No. 913,500, Jun. 7, 1978, Pat. No. 4,263,432. This application Nov. 19, 1980, Ser. No. 208,298

Claims priority, application Japan, Jun. 10, 1977, 52-68699; Jul. 28, 1977, 52-90772; Feb. 2, 1978, 53-10772

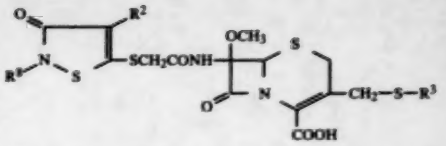
Int. Cl.³ C07D 501/57; A61K 31/54

U.S. Cl. 544—21 2 Claims

1. A process for the preparation of a 7α-methoxy-7β-(4-substituted methylene-1,3-dithientane-2-yl) carboxamido-3-heterocyclic thiomethyl-Δ^3-cephem-4-carboxylic acid represented by the formula



wherein R^2 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, $R^4S(O)_n$ group wherein R^4 represents a lower alkyl gorup and n represents 0, 1 or 2, a lower alkanoyl group, a phenyl group, a naphthyl group, a benzoyl group, a napthoyl group, a lower alkenyl group a sulfamoyl group, or a pyridyl group, or a thiadiazolyl group, and R^3 represents a lower alkyl-substituted tetrazolyl group or a lower alkyl-substituted thiadiazolyl group, and R^8 represents a hydrogen atom or an alkyl group which may have substituents selected from N-monoalkyl carbamoyl, N-dialkyl carbamoyl, and alkoxy carbonyl amino, which comprises treating the 7α-methoxy-3-heterocyclic thiomethyl-cephalosporin derivatives represented by the formula



wherein R^2, R^3 and R^8 have the same significance as above, with a base.

4,404,374

CEPHALOSPORANIC ACID DERIVATIVES

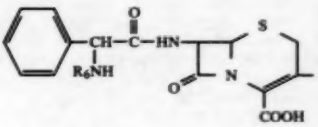
James H. Boothe, Montvale, N.J., and Adma S. Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

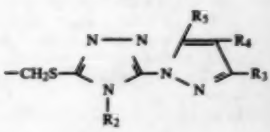
Division of Ser. No. 145,071, Apr. 30, 1980, Pat. No. 4,336,375. This application Apr. 12, 1982, Ser. No. 367,502

Int. Cl.³ C07D 501/36; A61K 31/545

U.S. Cl. 544—26 7 Claims

1. A compound of the formula:





wherein

R_2 is selected from the group hydrogen, amino, C_1–C_6 alkylamino and di-C_1–C_6 alkylamino;

R_3, R_4, and R_5 are the same or different and are selected from the group hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, phenyl, substituted phenyl, heterocyclic aryl, and R_3 and R_4 or R_4 and R_5 taken together are the moiety $—CH_2—(CH_2)_2—CH_2—$;

wherein the substituents on the phenyl are mono- or disubstituents which are the same or different and which are selected from the group C_1–C_3 alkyl, C_1–C_3 alkoxy, fluoro, chloro, bromo, and trifluoromethyl; and

wherein the heterocyclic aryl is selected from the group of five- and six-membered aromatic ring compounds containing one to three heteroatoms which are the same or different and which are selected from the group oxygen, nitrogen, and sulfur, and wherein said heterocyclic aryl is optionally substituted as defined above for substituted phenyl;

R_6 is hydrogen or C_1–C_6 alkoxycarbonyl;

and the pharmaceutically acceptable non-toxic salts thereof.

4,404,375

CEPHALOSPORANIC ACID DERIVATIVES

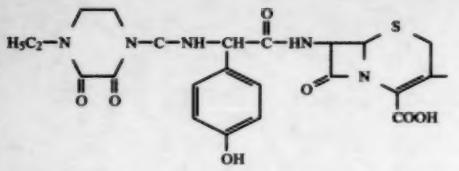
James H. Boothe, Montvale, N.J., and Adma S. Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

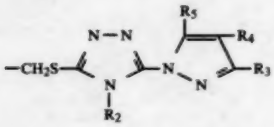
Division of Ser. No. 145,071, Apr. 30, 1980, Pat. No. 4,336,375. This application Apr. 12, 1982, Ser. No. 367,501

Int. Cl.³ C07D 501/36; A61K 31/545

U.S. Cl. 544—27 9 Claims

1. A compound of the formula





wherein

R_2 is selected from the group hydrogen, amino, C_1–C_6 alkylamino and di-C_1–C_6 alkylamino;

R_3, R_4, and R_5 are the same or different and are selected from the group hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, phenyl, substituted phenyl, heterocyclic aryl, and R_3 and R_4 or R_4 and R_5 taken together are the moiety $—CH_2—(CH_2)_2—CH_2—$;

wherein the substituents on the phenyl are mono- or di-substituents which are the same or different and which are selected from the group C_1–C_3 alkyl, C_1–C_3 alkoxy, fluoro, chloro, bromo, and trifluoromethyl; and

wherein the heterocyclic aryl is selected from the group of five- and six-membered aromatic ring compounds containing one to three heteroatoms which are the same or different and which are selected from the group oxygen, nitrogen, and sulfur, and wherein said heterocyclic aryl is optionally substituted as defined above for substituted phenyl;

and the pharmaceutically acceptable non-toxic salts thereof.

4,404,376

CEPHALOSPORANIC ACID DERIVATIVES

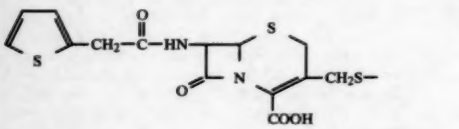
James H. Boothe, Montvale, N.J., and Adma S. Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

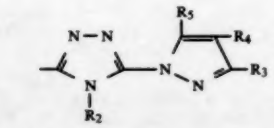
Division of Ser. No. 145,071, Apr. 30, 1980, Pat. No. 4,336,375. This application Apr. 12, 1982, Ser. No. 367,503

Int. Cl.[3] **C07D** *501/36;* **A61K** *31/545*

U.S. Cl. 544—27 **5 Claims**

1. A compound of the formula:





wherein

R_2 is selected from the group hydrogen, amino, C_1–C_6 alkylamino and di-C_1–C_6 alkylamino;

R_3, R_4, and R_5 are the same or different and are selected from the group hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, phenyl, substituted phenyl, heterocyclic aryl, and R_3 and R_4 or R_4 and R_5 taken together are the moiety $—CH_2—(CH_2)_2—CH_2—$;

wherein the substituents on the phenyl are mono- or di-substituents which are the same or different and which are selected from the group C_1–C_3 alkyl, C_1–C_3 alkoxy, fluoro, chloro, bromo, and trifluoromethyl; and

wherein the heterocyclic aryl is selected from the group of five- and six-membered aromatic ring compounds containing one to three heteroatoms which are the same or different and which are selected from the group oxygen, nitrogen, and sulfur, and wherein said heterocyclic aryl is optionally substituted as defined above for substituted phenyl;

and the pharmaceutically acceptable non-toxic salts thereof.

4,404,377

HETEROCYCLIC/AROMATIC FLUOROCARBON SURFACTANTS

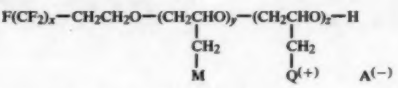
Virgil L. Seale, Houston, Tex.; James R. Stanford, Duncan, Okla.; James E. Briscoe, Duncan, Okla., and Glenn S. Penny, Duncan, Okla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 8, 1982, Ser. No. 355,504

Int. Cl.[3] **C07C** *95/02, 95/08;* **C07D** *295/08;* **C07C** *43/13*

U.S. Cl. 544—87 **6 Claims**

1. A composition represented by the formula:



wherein x is an integer or a fractional integer representing average values from 2–12; y and z are integers or fractional integers representing average values from 0–20 provided that the sum (y+z) is from 1–20; M is a halogen radical; Q is a nitrogen containing heterocyclic/aromatic cationic radical, and A is a halogen anion.

4,404,378

2-SUBSTITUTED OR UNSUBSTITUTED AMINOCARBONYLOXYALKYL-1,4-DIHYDROPYRIDINES

Tetsuji Miyano; Kunio Suzuki, both of Nagoya, and Nobuo Harada, Okazaki, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,137

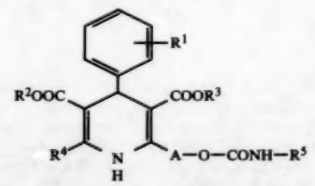
Claims priority, application Japan, Apr. 23, 1981, 56-60677

Int. Cl.[3] **C07D** *413/12, 211/90*

U.S. Cl. 544—131 **9 Claims**

1. A 2-substituted or unsubstituted aminocarbonyloxyalkyl-1,4-dihydropyridine represented by the formula

(I)



where R^1 is halogen, nitro, cyano or lower alkoxy; each of R^2 and R^3 is lower alkyl, lower haloalkyl, lower alkoxyalkyl, aralkyloxyalkyl, aryloxyalkyl, lower alkenoxyalkyl, N,N-di-lower alkylaminoalkyl, N-lower alkyl-N-aralkylaminoalkyl, piperidylalkyl, 4-lower alkyl piperazinylalkyl, morpholinoalkyl or 1-pyrrolidinylalkyl; R^4 is lower alkyl; A is lower alkylene; and R^5 is hydrogen, lower alkyl, cycloalkyl of 3 to 7

carbon atoms, or carbocyclic aryl or pyridyl unsubstituted or substituted by one or two substituents selected from halogen, nitro, lower alkyl, lower alkoxy, di-lower alkylamino and cyano.

4,404,379

CYCLOAMINALS AND A PROCESS FOR THEIR PREPARATION

Manfred Hajek, Cologne; Kuno Wagner, Leverkusen; Walter Uerdingen, Bergisch-Gladbach, and Wolfgang Wellner, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

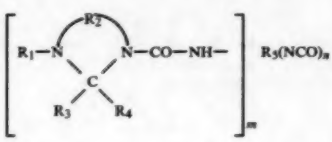
Filed Aug. 21, 1978, Ser. No. 935,439

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739313

Int. Cl.³ C07D *239/04*

U.S. Cl. 544—231 **8 Claims**

1. Compounds corresponding to the following formula:



wherein

m represents an integer of from 1 to 3 and

n represents 0, 1 or 2 and the sum of m+n is 2 or 3;

R_1 represents an aliphatic hydrocarbon group which is optionally cyano-substituted and which has from 1 to 6 carbon atoms, a cycloaliphatic hydrocarbon group having from 5 to 10 carbon atoms or an araliphatic hydrocarbon group having from 7 to 10 carbon atoms;

R_2 represents a divalent aliphatic hydrocarbon group having from 2 to 6 carbon atoms, at least two carbon atoms being arranged between the two nitrogen atoms;

R_3 and R_4 are identical or different and represent hydrogen, aliphatic hydrocarbon groups having from 1 to 18 carbon atoms, cycloaliphatic hydrocarbon groups having from 5 to 10 carbon atoms or aromatic hydrocarbon groups having from 6 to 10 carbon atoms or the two groups R_3 and R_4 together with the carbon atom of the heterocyclic ring may form a 5-membered or 6-membered cycloaliphatic ring;

R_5 represents the (m+n)-valent group obtained by the removal of m+n isocyanate groups from an (m+n)-valent polyisocyanate.

4,404,380

TRIAZOLOPYRIMIDINES

Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

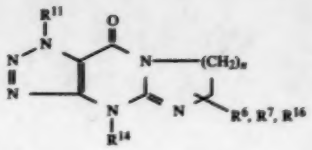
Division of Ser. No. 17,771, Mar. 5, 1979, Pat. No. 4,298,734, which is a continuation-in-part of Ser. No. 869,203, Jan. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 768,291, Feb. 14, 1977, abandoned. This application Aug. 14, 1980, Ser. No. 178,201

Claims priority, application Canada, Jan. 11, 1978, 294770

Int. Cl.³ C07D *487/12, 487/14*

U.S. Cl. 544—251 **10 Claims**

1. A compound selected from the group consisting of



Formula XI

wherein

Q is O, S, or NR^{10},

R^{10} is selected from the group consisting of hydrogen, lower alkyl having up to 8 carbon atoms, lower alkenyl or lower alkynyl each having 3 to 8 carbon atoms, dialkylaminoalkyl having 4 to 12 carbon atoms, cycloalkyl having 3 to 5 carbon atoms, cycloalkylalkyl having 4 to 12 carbon atoms, pyridylmethyl, aralkyl or substituted aralkyl each having 7 to 12 carbon atoms, aryloxyalkyl or substituted aryloxyalkyl each having 8 to 12 carbon atoms wherein each of said substituted aralkyl, and substituted aryloxyalkyl groups having 1 or 2 non-sterically hindering substituents selected from halogen, alkoxy, and alkyl, and each of said alkoxy and alkyl groups having up to 6 carbon atoms,

R^{11} is alkoxycarbonyl having 2 to 4 carbon atoms, aminoalkyl having 2 to 8 carbon atoms, or is independently selected from the foregoing group defined for R^{10},

R^6 and R^7 are attached to ring carbon atoms and are selected from hydrogen, methyl, and ethyl,

R^{16} represents hydrogen or a double bond between adjacent ring carbon atoms,

n is the integer 1, 2, or 3,

the pharmaceutically acceptable acid addition and quaternary ammonium salts of the foregoing compounds, and the pharmaceutically acceptable metal, ammonium, and amine salts of the foregoing compounds wherein R^{11} is hydrogen.

4,404,381

NOVEL 3,5-DIKETO-PIPERAZINYL COMPOUNDS CONTAINING EPOXIDE SUBSTITUTED IMIDES

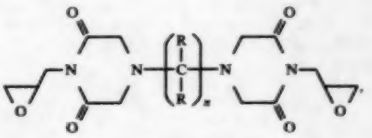
Edmund P. Woo, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 19, 1981, Ser. No. 275,471

Int. Cl.³ C07D *241/02*

U.S. Cl. 544—357 **4 Claims**

1. A compound corresponding to the formula



wherein each R is independently hydrogen or a C_1 to C_{12} alkyl group and n is an integer from 2 to 20.

4,404,382

PIPERAZINYL-SUBSTITUTED IMIDAZOLES

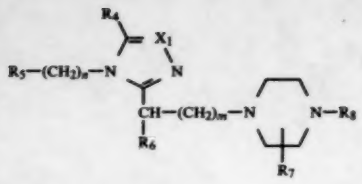
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 187,920, Sep. 17, 1980, Pat. No. 4,338,453. This application Mar. 26, 1982, Ser. No. 362,447

Int. Cl.³ C07D *401/00, 403/00*; A61K *31/41*

U.S. Cl. 544—360 **15 Claims**

1. A compound according to formula I



or a pharmacologically acceptable salt thereof,

wherein X_1 is

(a) =CH—; or

(b) =C(CH_3)—;

wherein m is zero, one, 2 or 3;

wherein n is zero, one or 2,

wherein R_4 is:

(a) hydrogen;

(b) alkyl of one to three carbon atoms, inclusive;

(c) $R_{54}OCH_2$—, wherein R_{54} is defined below;

(d) —CH(R_{35})(OH); or

(e) —R_{35};

wherein R_5, R_{15}, R_{25} and R_{35} are the same or different and are

(i) 2,3, or 4 pyridinyl, or

(ii) phenyl substituted by zero to 2 chloro, fluoro, bromo, alkyl of from one to 3 carbon atoms, or alkoxy of from one to 3 carbon atoms, or

(iii) phenyl substituted by one trifluoromethyl and zero to one of the previous phenyl substituents,

wherein R_6 is:

(a) hydrogen;

(b) —OR_{54};

(c) alkanoyloxy of from one to 3 carbon atoms; or

(d) alkyl of from one to 3 carbon atoms; with the proviso that when m is zero, R_6 does not contain oxygen;

wherein R_7 is

(i) hydrogen,

(ii) methyl,

(iii) phenylmethyl, or

(iv) phenylethyl,

wherein R_8 is

(i) —R_{15};

(ii) —CH_2R_{15}, or

(iii) —$CHR_{15}R_{25}$;

wherein R_{17} is methyl, phenyl, benzyl, or 2-phenylethyl; and wherein R_{54} is hydrogen or alkyl of one to 3 carbon atoms; or an enantiomer (when R_4 is —CH(R_{35})OH or when R_6 is not hydrogen) or diastereomer (when R_4 is —CH(R_{35})OH and R_6 is not hydrogen) of such compound.

4,404,383

N,N'-BIS[5-HYDROXYMETHYLFURFURYL]PIPERAZINE

Andrew P. Dunlop, Riverside, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 62,370, Jul. 31, 1979, abandoned. This application Jun. 26, 1981, Ser. No. 277,627

Int. Cl.³ C07D *405/14*

U.S. Cl. 544—379 **1 Claim**

1. The new composition of matter, N,N'-bis[5-hydroxymethylfurfuryl]piperazine.

4,404,384

O-[3-(4-SUBSTITUTED-PIPERAZIN-1-YL)-2-HYDROXYPROPYL]-HYDROXYLAMINES

Ulrich Gebert, Kelkheim; Werner Thorwart, Wiesbaden; Jaromir Komarek, Wiesbaden, and Carl Cartheuser, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 121,910, Feb. 15, 1980, abandoned, which is a continuation of Ser. No. 850,057, Nov. 9, 1977, abandoned. This application May 28, 1981, Ser. No. 267,722

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1977, 2651083

Int. Cl.³ C07D *295/08*; A61K *31/50*

U.S. Cl. 544—394 **6 Claims**

1. A compound of Formula I:

$$H_2N-O-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-X \qquad (I)$$

wherein X is piperazine substituted in a 4-position by a member selected from the group consisting of:

(a) alkyl and hydroxyalkyl having up to four carbon atoms; and

(b) phenylalkyl and diphenylalkyl having up to four carbon atoms in the alkyl moiety wherein the phenyl radicals are unsubstituted or are substituted by halogen; and

(c) 3-aminooxy-2-hydroxypropyl.

4,404,385

NOVEL MODIFICATION OF PERYLENETETRACARBOXYLIC ACID-BIS-(3,5-DIMETHYLPHENYL)IMIDE

Fridolin Bäbler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,965

Claims priority, application Switzerland, Jul. 4, 1979, 6242/79; Jul. 5, 1979, 6293/79

Int. Cl.³ C07D *487/06*; D06P *3/79, 3/62, 3/26*

U.S. Cl. 546—37 **5 Claims**

1. Perylenetetracarboxylic acid-bis-(3,5-dimethylphenyl)-imide in a γ-modification which is characterised by an X-ray diffraction spectrum exhibiting very strong lines at interplanar spacings of 8.3, 3.61, 3.46 and 3.30 Å, and strong lines at interplanar spacings of 17.2, 10.3, 7.2, 6.7 and 4.09 Å.

3. A process for producing the γ-modification according to claim 1, wherein the known α- or β-modification or mixture thereof is treated with trifluoroacetic acid.

4,404,386

PROCESS FOR THE PREPARATION OF OPAQUE PERYLENETETRACARBOXYLIC ACID BIS-(3,5-DIMETHYLPHENYLIMIDE)

Fridolin Bäbler, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 12, 1981, Ser. No. 272,865

Claims priority, application Switzerland, Jun. 23, 1980, 4805/80

Int. Cl.³ C07D *487/06*; D06P *3/79, 3/62, 3/26*

U.S. Cl. 546—37 **5 Claims**

1. A process for the preparation of opaque perylenetetracarboxylic acid bis-(3,5-dimethylphenylimide), which comprises heating the alpha-modification of perylenetetracarboxylic acid bis-(3,5-dimethylphenylimide) in at least one aliphatic monocarboxylic acid selected from the group consisting of formic acid, acetic acid, propionic acid and monochloroacetic acid.

4,404,387

AMINOALKYL-SUBSTITUTED IMIDAZOLES

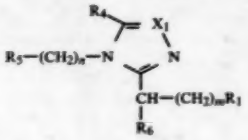
Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 187,920, Sep. 17, 1980, Pat. No. 4,338,453. This application Mar. 26, 1982, Ser. No. 362,446

Int. Cl.³ C07D *233/54, 403/08;* A61K *31/445*

U.S. Cl. 546—193 13 Claims

1. A compound according to formula I



or a pharmacologically acceptable salt thereof,

wherein X_1 is

(a) =CH—; or

(b) =C(CH_3)—;

wherein m is zero, one, 2 or 3;

wherein n is zero, one or 2,

wherein R_1 is:

(a) 1-piperidinyl substituted at the 3 or 4 position by R_{15}, wherein R_{15} is defined as below;

(b) —N(CH_3)—(CH_2)$_p$—R_{15}, wherein R_{15} and p are as defined below; or

(c) —NH—(CH_2)$_p$—R_{15}, wherein p is 1, 2, or 3 and R_{15} is as defined below;

wherein R_4 is:

(a) hydrogen;

(b) alkyl of one to three carbon atoms, inclusive;

(c) $R_{54}OCH_2$—, wherein R_{54} is defined below;

(d) —CH(R_{35})(OH); or

(e) —R_{35};

wherein R_5, R_{15}, R_{25} and R_{35} are the same or different and are

(i) 2,3, or 4 pyridinyl, or

(ii) phenyl substituted by zero to 2 chloro, fluoro, bromo, alkyl of from one to 3 carbon atoms, or alkoxy of from one to 3 carbon atoms, or

(iii) phenyl substituted by one trifluoromethyl and zero to one of the previous phenyl substituents,

wherein R_6 is:

(a) hydrogen;

(b) —OR_{54};

(c) alkanoyloxy of from one to 3 carbon atoms; or

(d) alkyl of from one to 3 cabon atoms; with the proviso that when m is zero, R_6 does not contain oxygen;

wherein R_{17} is methyl, phenyl, benzyl, or 2-phenylethyl; and wherein R_{54} is hydrogen or alkyl of one to 3 carbon atoms; or an enantiomer (when R_4 is —CH(R_{35})OH or when R_6 is not hydrogen) or diastereomer (when R_4 is —CH(R_{35})OH and R_6 is not hydrogen) of such compound.

4,404,388

PROCESS FOR PRODUCING 2-CHLOROPYRIDINES

Hansjakob Fäh, Ormalingen, and Alfred Grieder, Böckten, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

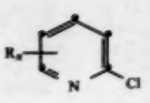
Filed Aug. 14, 1981, Ser. No. 292,847

The portion of the term of this patent subsequent to Sep. 1, 1998, has been disclaimed.

Int. Cl.³ C07D *213/02, 213/26, 213/55*

U.S. Cl. 546—345 16 Claims

1. A process for producing a 2-chloropyridine of the formula I,

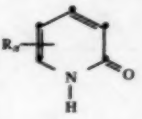


(I)

wherein

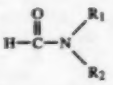
R independently of one another is C_1–C_4-alkyl, C_1–C_4-halogenalkyl, halogen or carboxyl and

n is zero or a number one to four, with the proviso that at most two substituents R can be alkyl, halogenalkyl or carboxyl at the same time, and that if R is chlorine and n is two one of them must not occupy the 3- or 5-position of the pyridine ring, by reacting a 2-pyridone of the formula (II)



(II)

wherein R and n have the meanings given above at 30°–150° C. with phosgene in the presence of an N,N-disubstituted formamide of the formula III



(III)

in which R_1 and R_2 can be identical or different and are each an alkyl group having 1 to 4 carbon atoms, or R_1 and R_2 together with the nitrogen atom form the pyrrolidino, piperidino or morpholino ring, and in the presence of an inert solvent.

4,404,389

THIAZOLE CONTAINING COUMARIN COMPOUNDS

Christos Vamvakaris, Kallstadt; Manfred Patsch, Wachenheim, and Wolfgang Mach, Hockenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

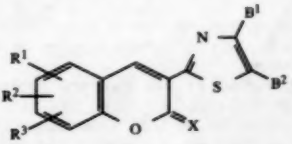
Continuation of Ser. No. 11,995, Feb. 14, 1979. This application Jul. 29, 1982, Ser. No. 403,118

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807761

Int. Cl.³ C07D *417/04*

U.S. Cl. 548—201 2 Claims

1. A compound of the formula:



Ia

wherein

B^1 and B^2 independently of one another are hydrogen; C_1–C_6 alkyl; C_1–C_6 alkoxy optionally interrupted by oxygen or sulfur; hydroxy; alkylmercapto; $C_6H_5SCH_2$— or $C_6H_5SC_2H_4$— optionallly substituted in the phenyl ring by chloro, bromo, hydroxy or alkoxy; $COOCH_3$, $COOC_2H_5$, $COOC_3H_7$, $COOC_4H_9$, $COOC_5H_{11}$, $COOC_6H_{13}$, $COOC_8H_{17}$, $COOCH_2$—CH=CH_2, $COOC_2H_4OCH_3$, $COOC_2H_4OC_2H_5$, $COOC_2H_4OC_4H_9$,

$COOC_2H_4OC_2H_4OCH_3$, $COOC_2H_4OC_2H_4OC_4H_9$, $COOCH_2CH_2CH_2OCH_3$, $COOCH_2CH_2CH_2OC_3H_7$, $COO(CH_2)_3OC_2H_4OC_6H_5$, $COO(CH_2)_3OCH_2C_6H_5$, $COOC_2H_4SC_2H_5$ OR $COOC_2H_4SC_6H_5$; carbamoyl or substituted carbamoyl;

B^2 in addition is cyano, C_2–C_4 alkanoyl, benzoyl, C_1–C_4 alkylsulfonyl or phenylsulfonyl;

R^1 is hydrogen, C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, C-acyloxy, chloro, bromo, amino or substituted amino;

R^2 is hydrogen; C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy or C-acyloxy;

R^3 is hydrogen, chloro or bromo;

R^1 and R^2 together are —CH=CH—CH=CH— and X is NH or O.

4,404,390

MESOIONIC 1,2,4-TRIAZOLIUM SILVER HALIDE STABILIZER PRECURSORS

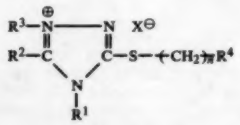
Henry W. Altland, Rochester, and Daniel D. Shiao, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 215,783, Dec. 12, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,567

Int. Cl.³ C07D *249/10*

U.S. Cl. 548—263 **7 Claims**

1. A mesoionic 1,2,4-triazolium-3-thiolate precursor represented by the formula:



wherein:

R^1 is alkyl containing 1 to 18 carbon atoms,

alkenyl containing 3 to 18 carbon atoms, cycloalkyl containing 3 to 12 carbon atoms, or aryl containing 6 to 20 carbon atoms;

R^2 is alkyl containing 1 to 9 carbon atoms or aryl containing 6 to 12 carbon atoms;

R^3 is alkyl containing 1 to 18 carbon atoms, aryl containing 6 to 20 carbon atoms, or cycloalkyl containing 3 to 12 carbon atoms;

R^4 is carboxyaryl containing 7 to 13 carbon atoms, cyano (CN) or amido ($CONH_2$);

R^5 and R^6 are individually hydrogen, alkyl containing 1 to 18 carbon atoms, or aryl containing 6 to 20 carbon atoms, provided that when one of R^5 and R^6 is alkyl then both R^5 and R^6 are alkyl;

n is 1 or 2; and

X is an acid anion.

4,404,391

METHOD FOR THE PREPARATION OF N-METHYL AND -N-ETHYL-1-PYRROLIDONES

Peter J. N. Meyer, Munstergeleen, and Josef M. Penders, Maastricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 1, 1981, Ser. No. 249,983

Claims priority, application Netherlands, Apr. 4, 1980, 8002019

Int. Cl.³ C07D *207/267, 207/27*

U.S. Cl. 548—552 **7 Claims**

1. A process for the preparation of N-methyl-2-pyrrolidone or N-ethyl-2-pyrrolidone which consists essentially in the step of reducing the corresponding N-(α-hydroxyalkyl)-2-pyrrolidone in the liquid phase in a trifluoroacetic acid free inert solvent selected from the group consisting of water, N-methyl-2-pyrrolidone, or N-ethyl-2-pyrrolidone under an atmosphere of hydrogen gas at a partial hydrogen pressure of between 1 bar and 175 bar at a temperature of between 20° C. and 150° C. in the presence of a noble metal hydrogenation catalyst wherein the metal component thereof is selected from the group consisting of platinum, ruthenium, and palladium.

4,404,392

RESOLUTION OF α-PIVALOYLOXYETHYL-(S)-3-(3,4-DIHYDROXYPHENYL)-2-METHYLALANTINATE INTO ITS α AND β ISOMERS

Ramon J. Alabaster, Puckeridge, and Stanley H. B. Wright, Sawbridgeworth, both of England, assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 16, 1981, Ser. No. 321,498

Int. Cl.³ C07C *101/32*

U.S. Cl. 560—40 **9 Claims**

1. A process for resolving alpha-pivaloyloxyethyl-(S)-3-(3,4-dihydroxyphenyl)-2-methylalaninate (POE Ester) into its alpha- and beta-isomers which comprises:

(a) reacting POE Ester with d(+)-tartaric acid to form a mixture of alpha-isomer POE Ester- and beta-isomer POE Ester-(+)-hydrogen tartrate salts;

(b) isolating said beta-isomer-(+)-hydrogen tartrate salt from said mixture by fractional crystallization, leaving mother liquor;

(c) treating said mother liquor from step (b) with first a mild base and second a mineral acid to form the crystalline alpha-isomer POE Ester mineral acid salt.

4,404,393

15-DEOXY-16-HYDROXY-16-(1'FLUOROVINYL) PROSTAGLANDINS AND DERIVATIVES

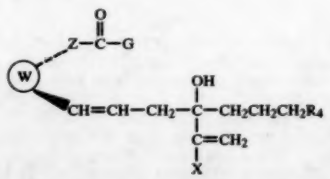
Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 29, 1981, Ser. No. 268,179

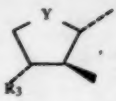
Int. Cl.³ C07C *181/00*

U.S. Cl. 560—121 **100 Claims**

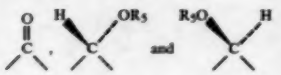
1. Compounds of the formula



or a racemic mixture thereof and the mirror image thereof wherein W is selected from the group:



wherein Y is a divalent moiety selected from the group consisting of:



wherein R_5 is hydrogen or C_2 to C_6 alkanoyl;

R_3 is selected from the group hydrogen and hydroxy; R_4 is selected from the group hydrogen and C_1 to C_3 alkyl; G is selected from the group hydroxy, and C_1 to C_6 alkoxy; Z is selected from the group $-(CH_2)_n-$, $-(CH_2)_mOCH_2-$, $-(CH_2)_mSCH_2$ and

$$-CH_2CH=CH(CH_2)_p-,$$

cis

wherein n is the integer 5 to 8, m is the integer 3 to 6 and p is the integer 2 to 5; and X is selected from the group fluorine, chlorine and bromine with the proviso that when Y is

then Z must be

$$-CH_2CH=CH(CH_2)_p-;$$

cis or trans

and when G is hydroxy the pharmaceutically acceptable salts thereof.

4,404,394

PROCESS FOR PRODUCING ADIPIC ACID DIESTER

Nobuo Isogai; Motoyuki Hosokawa; Takashi Okawa; Natsuko Wakui, and Toshiyasu Watanabe, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 318,980

Claims priority, application Japan, Nov. 25, 1980, 55-165718

Int. Cl.³ C07C *67/38*

U.S. Cl. 560—204 **6 Claims**

1. A process for producing an adipic acid diester which comprises:

the first step of reacting butadiene, carbon monoxide and an alcohol in the presence of a cobalt carbonyl catalyst and amine solvents at a temperature of from 80° to 160° C. to form a 3-pentenoic acid ester, the amount of the alcohol employed being more than 2 moles per 1 mole of butadiene, and the amount of the solvents employed being in the range of 0.05 to 10 parts by weight per 1 part by weight of butadiene; and

the second step of reacting the 3-pentenoic acid ester in the reacting mixture of the first step, carbon monoxide and the unreacted alcohol in the presence of the catalyst and the solvents at a temperature of from 160° to 220° C., said 3-pentenoic acid ester being subjected to the reaction of the second step without being separated from the reaction mixture,

wherein the amine solvents comprise at least two amine solvents selected from the group consisting of pyridine, quinoline, isoquinoline, substituted pyridine, substituted quinoline and substituted isoquinoline in which any substituent or substituents are selected from the group consisting of alkyl having 1–6 carbon atoms, alkenyl having 1–6 carbon atoms, aryl, alkaryl having 7–10 carbon atoms and aralkyl having 7–10 carbon atoms.

4,404,395

ACRYLATE PRODUCTION

Kenneth H. Markiewitz, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 136,440, Apr. 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 97,932, Nov. 27, 1979, abandoned. This application Jun. 21, 1982, Ser. No. 390,662

Int. Cl.³ C07C *67/26*

U.S. Cl. 560—209 **7 Claims**

1. In a method for the preparation of a hydroxy compound selected from the group consisting of hydroxy alkyl acrylates and hydroxy alkyl methacrylates by the reaction of an alkylene oxide with an acrylic component selected from the group consisting of acrylic acid and methacrylic acid in the presence of a chromium compound and previously obtained hydroxy compound, the improvement which comprises the steps of initially mixing to form a solution in the substantial absence of water said acrylic or methacrylic acid with from about 0.05% to 5% based on the weight of the acid of chromium trioxide and from about 5 to 20% by weight of the acid of previously obtained hydroxy compound and subsequent thereto continually adding the alkylene oxide to the solution in a total amount of from about 0.90 to 1.5 mols of alkylene oxide per mol of acrylic or methacrylic acid.

4,404,396

PROCESS FOR THE PREPARATION OF 2-(2,4-DICHLOROPHENOXY)-PHENYLACETIC ACID

Colin Thomson, Loughborough, and Neil J. Tweddle, Thorngumbald, both of England, assignors to Reckitt & Colman Products Limited, London, England

Filed Jan. 11, 1982, Ser. No. 338,492

Claims priority, application United Kingdom, Jan. 24, 1981, 8102197

Int. Cl.³ C07C *65/00*

U.S. Cl. 562—465 **4 Claims**

1. A process for the preparation of 2-(2,4-dichlorophenoxy)-phenylacetic acid in which equimolar proportions of the potassium salts of 2-chlorophenylacetic acid and 2,4-dichlorophenol are reacted in toluene, xylene, ethylbenzene, cumene or mixtures thereof, at a temperature in the range 100° C. to the boiling point of the reaction mixture, in the presence of a copper chloride catalyst, followed thereafter by acidification.

4,404,397

HIGH CONVERSION OF C_3 AND C_4 OLEFINS TO CORRESPONDING UNSATURATED ALDEHYDES AND ACIDS WITH STABLE MOLYBDENUM CATALYSTS

Chelliah Daniel, Columbus, Ohio, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 133,045, Mar. 24, 1980, Pat. No. 4,272,408, which is a continuation-in-part of Ser. No. 952,177, Oct. 17, 1978, Pat. No. 4,212,767. This application Dec. 29, 1980, Ser. No. 221,130

Int. Cl.³ C07C *51/25, 57/05, 45/35, 47/22*

U.S. Cl. 562—546 **5 Claims**

1. The method of converting C_3 to C_4 monoolefins to the corresponding unsaturated carboxylic acids in a single stage operation with accompanying production of intermediate aldehydes, which comprises contacting such olefin at a temperature in the range of about 300° to about 450° C. with a

catalyst of the type defined as a stable active catalyst containing a heteropoly phosphomolybdate anion in which the molybdenum is in the anion defect state obtained by a chloride ion stabilization method, which method comprises combining a molybdic acid or soluble non-metallic molybdate with a water-soluble acid or non-metallic salt of phosphorus in aqueous solution, adding to the mixture an aqueous chloride ion, optionally phosphotungstic acid or a phosphotungstate in aqueous solution and drying and calcining the resulting combination to yield a catalytically active heteropoly phosphomolybdate precursor surface, said catalyst comprising said catalytically active precursor surface impregnated with at least one cation from the group consisting of iron and cobalt and with a compound containing a non-metallic ion selected from the group consisting of tellurium and selenium, wherein the resulting impregnated catalyst is one corresponding to an empirical formula of the group consisting of:

$$M_{2.3\text{-}5}R_{2\text{-}3}P_{1.5\text{-}2.5}Mo_{20}O_z$$

$$M_{1\text{-}3}R_{0.5\text{-}2}P_{1\text{-}1.5}W_{1\text{-}2}Mo_{10}O_z$$

$$M_{1\text{-}2}R_{1\text{-}3}P_{2\text{-}4}Mo_{20}W_{1\text{-}3}O_z$$

wherein M comprises one or more metal cations from the group consisting of iron and cobalt, R is at least one element from the group consisting of selenium and tellurium and z represents the residual valence to satisfy the formula.

4,404,398

PREPARATION OF UNSATURATED FLUOROCARBON ACIDS

Norman R. DeLue, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 868,787, Jan. 12, 1978. This application Nov. 25, 1981, Ser. No. 324,747

Int. Cl.³ C07C *57/04*

U.S. Cl. 562—598 **7 Claims**

1. A method of increasing the yield of perfluoroacrylic acid monomer prepared by the method comprising forming CF_2=CF—COOLi and thereafter contacting the CF_2=CF—COOLi with HCl, which method comprises contacting with HCl under substantially anhydrous conditions.

4,404,399

COPRODUCTION OF ANILINE AND DIPHENYLAMINE

Nand K. Kochar, Bronx, and Brian J. Ozero, New York, both of N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,532

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—402 **7 Claims**

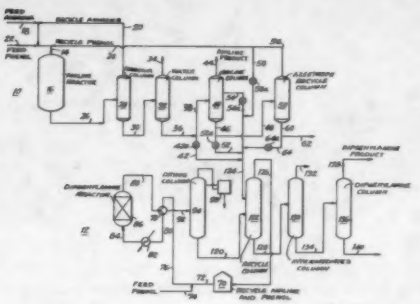
1. A process for the coproduction of aniline and diphenylamine from phenol and ammonia comprising the steps of

(a) forming an aniline reaction mixture containing ammonia and phenol;

(b) at least partially reacting said aniline reaction mixture in the presence of a catalyst and under aniline forming conditions and thereby forming an aniline reaction effluent mixture containing aniline, water and unreacted ammonia and phenol;

(c) separating at least a portion of said unreacted phenol and aniline formed in step (b) and at least partially reacting then under diphenylamine forming conditions to form a mixture containing diphenylamine and unreacted aniline and phenol;

(d) recovering product aniline from the said aniline reaction effluent mixture; and



(e) recovering product diphenylamine from the mixture formed in step (c).

4,404,400

PROCESS FOR THE PREPARATION OF 4-NITRODIPHENYLAMINES

Klaus-Peter Heise, Bergisch Gladbach, and Karlfried Wedemeyer, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

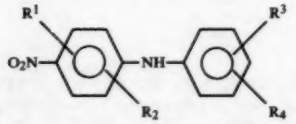
Filed Sep. 2, 1982, Ser. No. 414,224

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137041

Int. Cl.³ C07C *85/04*

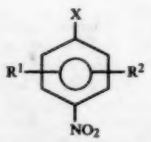
U.S. Cl. 564—406 **12 Claims**

1. In a process for the preparation of a 4-nitrodiphenylamine of the formula



wherein

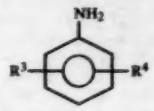
R^1, R^2, R^3 and R^4 are identical or different and independently represent hydrogen or an alkyl radical having 1 to 9 carbon atoms, by contacting a halogenonitrobenzene of the formula



wherein

X represents chlorine or bromine and

R^1 and R^2 have the abovementioned meaning, with a primary aromatic amine of the formula



wherein

R^3 and R^4 have the abovementioned meaning, in the presence of a neutralizing agent and in the presence of copper or a copper compound, the improvement wherein the process is carried out in the presence of a cyclic, 1,n-diaza compound wherein n=3, 4 or 5, wherein the nitrogen atoms of said diaza compound do not carry any hydrogen and at least one nitrogen atom is constituent of a double and at least one nitrogen atom is a constituent of a ring, and the 1,n-diaza compound is incapable of forming an anion in an aqueous-alkaline solution.

4,404,401

PROCESS FOR THE PREPARATION OF PARA-AMINO-DIPHENYLAMINE

Hans G. Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Feb. 23, 1979, Ser. No. 14,672

Int. Cl.³ C07C *83/02*

U.S. Cl. 564—416 **11 Claims**

1. In an improved process for the preparation of para-amino diphenylamine in which para-nitroso-diphenylhydroxylamine is catalytically hydrogenated in the presence of an organic solvent and one or more metal compounds selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, and platinum, and their sulfidic compounds, at temperatures from about 20° to 200° C., the improvement comprising utilizing as the organic solvent one or more members of the group consisting of aniline and aniline derivatives containing ring-alkyl groups, N-alkyl groups, and combinations thereof, wherein the ring-alkyl groups contain a total of 1 to 6 carbon atoms and the N-alkyl groups each contain from 1 to 6 carbon atoms.

4,404,402

ANILINE INTERMEDIATES

David W. Ladner, Hamilton Square, and Barrington Cross, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

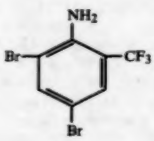
Continuation of Ser. No. 179,340, Aug. 18, 1980, abandoned.

This application Mar. 4, 1982, Ser. No. 354,682

Int. Cl.³ C07C *87/60, 149/42, 91/40, 91/42*

U.S. Cl. 564—442 **1 Claim**

1. A compound having the following structural formula:



4,404,403

PROCESS FOR PRODUCING ALIPHATIC AMINES

Harold E. Swift, Gibsonia; Robert A. Innes, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,640

Int. Cl.³ C07C *85/06, 85/08*

U.S. Cl. 564—473 **22 Claims**

1. A process for producing aliphatic amines which comprises reacting an aliphatic alcohol or an aliphatic aldehyde with an aminating agent selected from the group consisting of ammonia, a primary amine and a secondary amine in the liquid phase in the presence of an unsupported catalyst consisting essentially of (1) copper oxide or copper hydroxide and (2) an organo nickel compound, wherein the nickel to copper atomic range is from about 0.0005:1 to about 0.2:1.

4,404,404

PROCESS FOR PRODUCING ALIPHATIC AMINES

Harold E. Swift, Gibsonia; Robert A. Innes, and Anatoli Onopchenko, both of Monroeville, all of Pa., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed Dec. 9, 1981, Ser. No. 328,641

Int. Cl.³ C07C *85/06, 85/08*

U.S. Cl. 564—473 **37 Claims**

1. A process for producing amines which comprises reacting an aliphatic alcohol or an aliphatic aldehyde with an aminating agent selected from the group consisting of ammonia, a primary amine in the liquid phase in the presence of an unsupported catalyst consisting essentially of (1) copper oxide or copper hydroxide and (2) a Group II A metal oxide or hydroxide.

4,404,405

PROCESS FOR THE PREPARATION OF POLYETHYLENE POLYAMINES

John R. Winters, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,243

Int. Cl.³ C07C *85/04, 85/06, 89/02*

U.S. Cl. 564—482 **14 Claims**

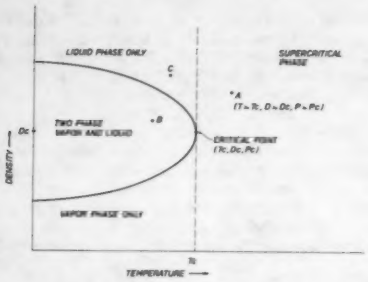
1. A continuous process for the manufacture of polyamines which comprises the joining of (I) a continuous process for the manufacture of ethylene amines including ethylenediamine which comprises; (A) providing (1) a continuous homogeneous fluid stream under pressure, which stream comprises ammonia, monoethanolamine, diethanolamine and triethanolamine as produced by the direct reaction of ethylene oxide and ammonia in which the number of moles of ammonia substantially exceeds the molar concentration of alcoholic hydroxyl groups present in such streams; (2) a continuous recycle stream consisting essentially of monoethanolamine; (3) an amination zone comprising a solid amination catalyst; and (4) a separation zone for separating monoethanolamine from the amination product stream removed from the amination zone which monoethanolamine forms said recycle stream; (B) feeding said recycle stream under pressure to said fluid stream to form a continuous amination feed stream under pressure; (C) feeding the amination feed stream to the amination zone under sufficient pressure to assure flow through the amination zone and to form an amination product stream containing ethylenediamine therein; (D) separating monoethanolamine from the amination product stream to form said recycle stream; and (E) continuously recovering ethylenediamine from said amination product stream; wherein said amination feed stream contains at least 70 weight percent monoethanolamine, based on the weight of the ethanolamines therein; the moles of ammonia in the amination feed stream exceeds the molar concentration of alcoholic hydroxyl groups in said amination feed stream; and the amination feed stream contains at least a 5% increase in the concentration of monoethanolamine over that contained in said fluid stream; with (II) a continuous process for the manufacture of polyethylene polyamines which comprises; (A) continuously feeding at least a portion of the ethylene amines produced by said continuous process (I) and ethylene dichloride, and optionally ammonia and water, to a polyamines reactor maintained at an elevated temperature; (B) optionally continuously recycling at least a portion of the ethyleneamines coming out of said polyamines reactor to the inlet feed of said polyamines reactor; and (C) continuously recovering polyethylene polyamines from the product stream.

4,404,406

OXIDATION OF ISOBUTANE UNDER SUPER-CRITICAL CONDITIONS

Eugene F. Lutz, and Elton G. Foster, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 5, 1981, Ser. No. 308,631
Int. Cl.³ C07C 179/02
U.S. Cl. 568—571 16 Claims



1. A process for the preparation of tertiary-butyl hydroperoxide by direct reaction of isobutane and molecular oxygen characterized by enhanced production per unit of reaction volume per unit of time, which comprises reacting isobutane and molecular oxygen reactants in a reaction mixture comprising isobutane reactant in a partial density of at least about 12 lb/ft^3 at a temperature above the critical temperature of the mixture and greater than about 140° C. and at a pressure above the critical pressure of the mixture and greater than about 700 psig.

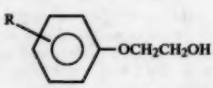
4,404,407

PROCESS FOR ENHANCING THE FRAGRANCE QUALITIES OF ETHYLENE GLYCOL MONOARYL ETHERS

Eugene G. Harris, West Chester, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

Filed Jun. 8, 1981, Ser. No. 271,730
Int. Cl.³ C07C 41/34, 41/38
U.S. Cl. 568—648 6 Claims

1. A process for enhancing the fragrance qualities of ethylene glycol monoaryl ethers obtained by the reaction of phenol with ethylene oxide in an alkaline reaction medium and having the formula



wherein R is hydrogen, a C_{1-8} alkyl group or C_{1-8} alkoxyl group which comprises intimately contacting the ethylene glycol monoaryl ether with 0.01 to 1 weight percent alkali metal borohydride at a temperature up to about 100° C., sparging by subsurfacely introducing and dispersing up to 10 weight percent water into the ethylene glycol monoaryl ether at a temperature of 75° C. to 120° C. and pressure less than 100 mm Hg, and drying the ethylene glycol monoaryl ether to a moisture content less than 1 percent.

4,404,408

COMPLEXED COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Hermann O. Wirth, Bensheim-Auerbach, and Hans-Helmut Friedrich, Lautertal-2, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 7, 1977, Ser. No. 831,309
Claims priority, application Switzerland, Sep. 8, 1976, 11391
Int. Cl.³ C07C 31/18, 31/22
U.S. Cl. 568—680 6 Claims

1. A complexed compound of the formula

$$M_n^m.X_m^n.qZ$$

in which

M is a proton or a m-valent cation selected from the group consisting of Li^+, Na^+, K^+, Be^{++}, Mg^{++}, Ca^{++}, Ba^{++}, Al^{+++}, Ce^{+++}, Ti^{+4}, ZrO^{++}, Th^{+4}, Nb^{+5}, Cr^{+++}, Mo^{+5}, Mn^{++}, Fe^{++}, Fe^{+++}, Co^{++}, Ni^{++}, Cu^{++}, Ag^+, Zn^{++}, Cd^{++}, B^{+++}, Si^{+4}, Sn^{++}, Sn^{+4}, Pb^{++}, Sb^{+++}, Sb^{+5}, In^{+++}, Bi^{+++}, Hg^{++} and Y^{+3},

X is a n-valent anion selected from the group consisting of hydroxyl, fluoride, chloride, bromide, iodide, thiocyanate, perchlorate, sulfide, thiosulfate, sulfate, acetate, nitrate, hydrogen phosphite, borate, carbonate, sulfite, silicate, hydrogen phosphate, titanate, phosphate, metadisilicate, metasilicate, metatrisilicate, hypophosphinite, metatitanate, methoxy, dihydrogen phosphite, metaborate, zirconate, oxide, metaphosphite, phosphite, trithiocarbonate, methylsulfonate, trifluoromethylsulfonate, octoxycarbonylmethylmercaptide, 2-(octoxycarbonyl)ethylmercaptide and β-carboxyethylmercaptide;

m is an integer from 1 to 5,

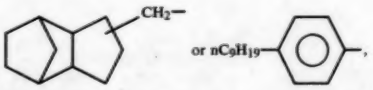
n is an integer from 1 to 4,

Z is a chelate-forming compound of the formula

$$R^3—L—(CH_2CHOHCH_2O)_x—H$$

where

R^3 is alkyl of 3 to 18 carbon atoms,



L is O or S,

x is an integer from 1 to 3, and

q is an integer from 1 to 12.

4,404,409

PROCESS FOR PREPARING METHYL TERTIARY-BUTYL ETHER

Yasuo Fujiwara, Tokyo, and Tetsuya Takezono, Kawasaki, both of Japan, assignors to Nippon Oil Co., Ltd., Japan

Filed Feb. 28, 1980, Ser. No. 125,655
Claims priority, application Japan, Mar. 5, 1979, 54-25349
The portion of the term of this patent subsequent to Jan. 8, 1997, has been disclaimed.
Int. Cl.³ C07C 41/00, 41/06
U.S. Cl. 568—697 12 Claims

1. A process for continuously preparing methyl tertiary-butyl ether which comprises reacting an isobutylene-containing hydrocarbon with methanol by continuously passing the isobutylene and methanol, in a molar ratio of isobutylene to methanol of 1/0.6–1.4 at a temperature of 60° to 100° C. with a liquid space velocity of 0.1 to 50 l/hour and at a pressure of 1 to 50 atmospheres, through a first reactor filled with strong acid type cation exchange resin particles having an average particle diameter of 0.2 to 10 mm; dividing the mixture of reaction products into two streams, the flow rate of the first

stream being 3 to 15 times the flow rate of the second stream; recycling the first stream to the first reactor; passing the second stream, at a temperature of 20° to 55° C. with a liquid space velocity of 0.1 to 50 l/hour and at a pressure of 1 to 50 atmospheres, through a second reactor filled with strong acid type cation exchange resin particles having an average particle diameter of 0.2 to 10 mm; passing the stream from the second reactor through a fixed bed filled with a water-insoluble solid particulate acid neutralizing agent having an average particle diameter of 0.1 to 10 mm at a temperature of 0° to 55° C.; passing the resulting reaction mixture into a distillation tower whereby the unreacted hydrocarbon is removed; and recovering a mixture containing methyl tertiary-butyl ether from the bottom of the distillation tower.

4,404,410

PROCESS FOR PREPARING 2,3-DIMETHYL-2,3-BUTANEDIOL

Boy Cornils, Dinslaken; Jürgen Weber, Oberhausen; Wolfgang Bernhagen, Mülheim, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 83,894, Oct. 11, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,229

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844637

Int. Cl.³ C07C *31/20*

U.S. Cl. 568—858 **8 Claims**

1. A process for preparing 2,3-dimethyl-2,3-butandiol which comprises introducing into a reaction vessel containing formic acid at 50° to 70° C. while stirred, 2,3-dimethylbutene and hydrogen peroxide, said 2,3-dimethylbutene and hydrogen peroxide being introduced into said formic acid simultaneously but separately and thereafter hydrolyzing pinacol monoformate so formed.

4,404,411

HYDROGENOLYSIS OF POLYOLS TO ETHYLENE GLYCOL IN NONAQUEOUS SOLVENTS

Murty S. S. R. Tanikella, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1982, Ser. No. 344,302

Int. Cl.³ C07C *21/20*

U.S. Cl. 568—861 **16 Claims**

1. Process for hydrogenolysis of polyols to a reaction product mixture consisting essentially of a major fraction of ethylene glycol and propylene glycol and a minor fraction of glycerol, other products and unreacted starting material, in which process the polyols are contacted and reacted with hydrogen in the presence of a substantially nonaqueous solvent, a hydrogenation catalyst and at least 10 mol percent of a base at a temperature of at least 225° C., said base selected from the oxide, hydroxide or alkoxide of an alkali metal, calcium, strontium or barium.

4,404,412

TRICHLOROETHYLENE COMPOSITION STABILIZED AGAINST OXIDATION

Nobuyuki Ishibe, and Jimmie K. Harden, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1982, Ser. No. 345,874

Int. Cl.³ C07C *17/42*

U.S. Cl. 570—109 **4 Claims**

1. A stable chlorinated solvent useful in degreasing operations which comprises trichloroethylene and a minor amount of a stabilizer which is an antioxidant consisting of α, 1,5-diazabicyclo-[5.4.0]undec-5-ene.

4,404,413

METHOD FOR THE PREVENTION OR INHIBITION OF POPCORN POLYMER IN ORGANIC MATERIAL CONTAINING VINYL COMPOUNDS

Weston W. Haskell, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 30, 1982, Ser. No. 394,992

Int. Cl.³ C07C *7/20*

U.S. Cl. 585—2 **10 Claims**

1. A method for the inhibition or prevention of popcorn polymer growth in organic materials comprising at least 50%w of at least one vinyl compound which method comprises treating said organic material with a polymer-inhibiting amount of an inhibitor selected from the group consisting of solid white phosphorus, liquid phosphorus, and phosphorus vapor.

10. A method for the inhibition or prevention of popcorn polymer growth in organic material comprising at least 50%w of at least one vinyl compound which method comprises treating said organic material with a polymer-inhibiting amount of carbon disulfide.

4,404,414

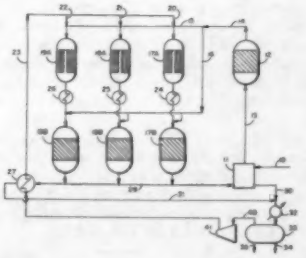
CONVERSION OF METHANOL TO GASOLINE

Joe E. Penick, Chappaqua, N.Y.; Sergei Yurchak, Media, Pa., and John C. Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,845

Int. Cl.³ C07C *1/20, 1/22*

U.S. Cl. 585—469 **13 Claims**



1. A process for the conversion of an oxygenated organic compound to a gasoline boiling range hydrocarbon product, which comprises:

(i) charging a portion of the oxygenated organic compound to each of a plurality of reaction zones containing a ZSM-5 type conversion catalyst in primary and secondary stages of a multi-stage reactor system,

(ii) contacting the portion of oxygenated organic compound with the conversion catalyst in each of the primary and secondary stages to form a hydrocarbon product in each reaction zone,

(iii) separating a recycle stream of light diluent gas from the hydrocarbon product, and

(iv) passing the recycle stream of diluent gas through each of the stages in sequence at an overall molar ratio of the diluent gas to the total amount of oxygenated organic compound fed to the reaction zones through which the diluent gas passes of about 4:1 to 6:1.

4,404,415
PROCESS FOR PRODUCING NONENES OR FOR SIMULTANEOUSLY PRODUCING NONENES AND DODECENES FROM PROPENE

Jean Gaillard, Lyons, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 21, 1982, Ser. No. 370,322
Claims priority, application France, Apr. 21, 1981, 81 08077
Int. Cl.³ C07C *2/24*
U.S. Cl. 585—512 **6 Claims**

1. A process for producing nonenes or a mixture of nonenes and dodecenes, comprising the steps of: introducing propylene into a liquid reaction phase comprising hexenes, in the presence of a soluble dimerization catalyst, at a temperature of 20°–60° C., the amount of propylene being controlled so as to maintain a propylene concentration in the liquid reaction phase of 0.05–1% by weight, withdrawing a portion of the liquid reaction phase, separating and recovering nonenes and higher olefins therefrom, and recycling at least a portion of the remaining withdrawn liquid phase of high hexenes content to the reaction zone.

4,404,416
ISOMERIZATION

John R. Adams, Sarnia, Canada; Abraham P. Gelbein, Morristown; Robert Hansen, West Caldwell, both of N.J.; Jimmy Y. Peress, Jamaica, N.Y., and Martin B. Sherwin, Potomac, Md., assignors to Polysar International S.A., Switzerland

Filed Jul. 24, 1981, Ser. No. 286,639
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ C07C *5/27*
U.S. Cl. 585—671 **8 Claims**

1. A process for the skeletal isomerization of straight chain olefins having 4 to 6 carbon atoms to branched chain olefins by contact at a temperature of from about 350° to about 550° C. with a residence time of from about 0.1 to about 1 second over a catalyst comprising alumina activated with a chlorine-containing compound characterized in that the alumina catalyst has an average particle size of from about 0.5×10^{-3} cm to about 160×10^{-3} cm, at least about 10% of the pore volume of the catalyst as measured by mercury porosimetry is attributable to pores having radii between about 100 and about 10,000 Angstroms, has a surface area of from about 50 to about 300 m^2/g and a pore volume of from about 0.4 to about 1 cc/g, the catalyst is activated by exposure at a temperature of from about 400° to about 500° C. to the chlorine-containing compound and the straight chain olefin feed to the catalyst contains from about 50 to about 3000 ppm by weight based on the olefin of the chlorine-containing compound, said chlorine-containing compound being selected from chlorine, hydrogen chloride and C_1 to C_4 alkyl or alkylene chlorides.

4,404,417
ISOMERIZATION

John R. Adams, Sarnia, Canada; Abraham P. Gelbein, Morristown; Robert Hansen, West Caldwell, both of N.J.; Jimmy Y. Peress, Jamaica, N.Y., and Martin B. Sherwin, Potomac, Md., assignors to Polysar International S.A., Switzerland

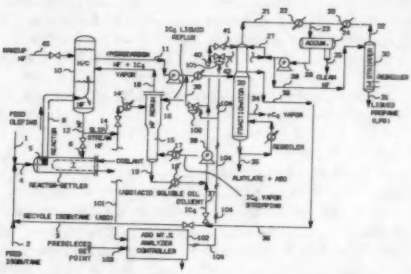
Filed Jul. 24, 1981, Ser. No. 286,643
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ C07C *5/27*
U.S. Cl. 585—671 **5 Claims**

1. A process for the skeletal isomerization of straight chain olefins having 4 to 6 carbon atoms to branched chain olefins by contact at a temperature of about 350° to about 550° C. with a residence time of from about 0.6 to about 2 seconds over a catalyst comprising alumina activated with a chlorine-containing compound characterized in that the alumina catalyst has an average particle size of from about 0.5×10^{-3} cm to about 160×10^{-3} cm and from about 3 to about 9% of the pore volume of the catalyst as measured by mercury porosimetry is attributable to pores having radii between about 100 and about 10,000 Angstroms, has a surface area of from about 50 to about 300 m^2/g and a pore volume of from about 0.4 cc/g to about 1 cc/g, the catalyst is activated by exposure at a temperature of from about 400° to about 500° C. to the chlorine-containing compound and the straight chain olefin feed to the catalyst contains from about 50 to about 3000 ppm by weight based on the olefin of the chlorine-containing compound, said chlorine-containing compound being selected from chlorine, hydrogen chloride and C_1 to C_4 alkyl or alkylene chlorides.

4,404,418
HF ALKYLATION PROCESS

Thomas Hutson, Jr., and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 4, 1982, Ser. No. 385,249
Int. Cl.³ C07C *3/54*
U.S. Cl. 585—710 **5 Claims**

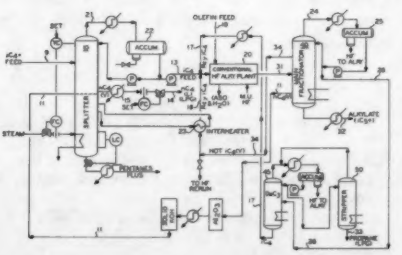


1. In an HF alkylation process wherein a preselected amount of acid soluble oils is described to be maintained in the alkylation system HF catalyst the improvement comprises returning a stream comprising acid soluble oils recovered from an HF rerun column and isobutane to the HF alkylation system so as to maintain said preselected amount of acid soluble oils in said system HF catalyst.

4,404,419
ALKYLATION PROCESS

Eldred J. Cabanaw, and John W. Mann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1982, Ser. No. 408,590
Int. Cl.³ C07C *2/58*
U.S. Cl. 585—723 **9 Claims**



1. In an alkylation process which comprises the steps of:
(a) subjecting an isoparaffin-containing feed comprising isoparaffins and normal paraffins to fractionation under

conditions to separate same into an overhead stream enriched in isoparaffins, an intermediate side stream of high purity normal paraffins, and a bottoms stream comprising higher boiling isoparaffins and normal paraffins,

(b) passing said overhead stream enriched in isoparaffins to an alkylation zone and therein contacting same with an olefin and an alkylation catalyst under alkylation conditions to form an alkylation effluent and recovering from said effluent a hydrocarbon phase comprising alkylate, isoparaffins and normal paraffins,

(c) passing said hydrocarbon phase to a second fractionation operated under conditions to separately recover an isoparaffin vapor stream, a normal paraffin vapor stream, and an alkylate product stream; and

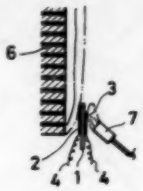
(d) passing said normal paraffin vapor stream to said fractionation in (a) at a locus below the point of withdrawal of said side stream of high purity normal paraffins.

4,404,420

COMBUSTION DETECTING ELEMENT

Toshifumi Yamana, Nagoya, Japan, assignor to Rinnai Kabushiki Kaisha, Aichi, Japan

Filed Aug. 14, 1981, Ser. No. 292,937
Claims priority, application Japan, Feb. 8, 1980, 55-13605
Int. Cl.³ H01L 35/28
U.S. Cl. 136—217 2 Claims



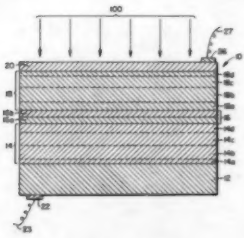
1. A combustion detecting element comprising an element body generating an electric change corresponding to a difference in oxygen concentration between a first surface and a second surface thereof, catalytic electrode layers on both surfaces for carrying out catalytic reaction with combustible gas and a lead wire connected to each layer, characterized in that the catalytic electrode layers have substantially different capabilities in catalytic reaction with combustible gas and in that the element body is so arranged such that one surface of the element body having the catalytic electrode layer of the comparatively smaller catalytic reaction capability is exposed to an interior of a combustion atmosphere of a standing burner and the other surface thereof having the catalytic electrode layer of the comparatively larger catalytic reaction capability faces a burner of which a combustion condition is to be monitored.

4,404,421

TERNARY III-V MULTICOLOR SOLAR CELLS AND PROCESS OF FABRICATION

Lewis M. Fraas, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 26, 1982, Ser. No. 352,680
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—249 16 Claims



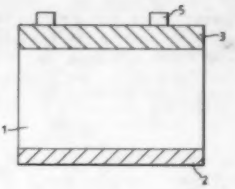
1. A photovoltaic device comprising:
a conductive substrate;
a layer of $GaAs_{1-y}Sb_y$ having regions of differing conductivity forming a homojunction therein contacting said substrate and lattice matching the substrate to within about ±1%;
a shorting junction layer contacting the surface of said GaAsSb layer opposite to the surface contacting said substrate;
a layer of $GaAs_{1-x}P_x$ having a larger bandgap than said GaAsSb layer, said semiconductor layer contacting the surface of said shorting junction layer opposite to said surface contacting said GaAsSb layer; and
means forming electrical contacts to said device to withdraw photogenerated current therefrom.

4,404,422

HIGH EFFICIENCY SOLAR CELL STRUCTURE

Martin A. Green, Sydney, and Andrew W. Blakers, Campbell, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Sep. 15, 1981, Ser. No. 302,650
Claims priority, application Australia, Sep. 26, 1980, 5773/80
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—255 8 Claims



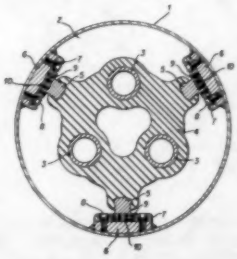
1. A solar cell comprising a body of semiconductor material having top and bottom metal contact layers, said body having two regions of different conductivity type forming a junction therebetween, namely a lower region containing a dopant of one conductivity type in contact with the bottom metal contact layer and an upper region containing a dopant of opposite conductivity type, said upper region being separated from said top metal contact layer by a thin insulating layer, said top metal contact being configured to allow the passage of incident radiation.

4,404,423

THREE-PHASE GAS INSULATED BUS

Takaaki Sakakihara, and Yoshihiro Kanno, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1981, Ser. No. 305,225
Claims priority, application Japan, Sep. 24, 1980, 55-134688[U]
Int. Cl.³ H02G 5/06
U.S. Cl. 174—27 3 Claims



1. A gas insulated bus having high voltage conductors inside a grounded cylindrical metal sheath filled with an insulating gas, comprising:
three, three-phase conductors arranged inside said sheath, each said conductor located at a respective vertex of a triangle within said sheath as seen in section;
an insulating means formed integrally about all of said conductors for supporting said conductors within said sheath,

said insulating means including at least two leg portions, each said leg portion having a supporting part;

fitting means fixed on the inner wall of said sheath for radially-slidably supporting each of said leg portions of said insulating means, said fitting means being electrically connected to each said supporting part of said insulating means; and

buffering means mounted between said supporting part of said insulating means and said fitting means for absorbing deformations of said sheath, said buffering means having a low friction characteristic,

wherein said fitting means and buffering means are annular and concentric, said supporting part being concentrically fitted into said buffering means.

4,404,424

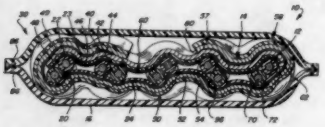
SHIELDED TWISTED-PAIR FLAT ELECTRICAL CABLE

William A. King, Aurora, and John W. Kincaid, Batavia, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 15, 1981, Ser. No. 311,524

Int. Cl.³ H01B *7/08, 11/06, 11/10*

U.S. Cl. 174—34 **5 Claims**



2. A flat multi-conductor electrical cable comprising:

a film of laminating material;

a plurality of unshielded pairs of unshielded insulated conductor wires bonded to said film so that predetermined spacing between said pairs is maintained, said film and said pairs of insulated conductor wires extending longitudinally along the cable, said pairs of insulated conductor wires extending substantially side-by-side parallel to one another, the individual wires of each said pair being twisted about one another for at least one portion of their mutual length;

a shielding member including a conductive layer substantially surrounding collectively said film and said plurality of pairs and closely conforming to said pairs of insulated wires so as to extend part way between adjacent said pairs of insulated conductors, said shielding member being bonded to said film and said conductor wires; and

a sheath of insulating material encasing said shielding member and said plurality of pairs of insulated conductor wires.

4,404,425

CABLE ASSEMBLY FOR UNDERCARPET SIGNAL TRANSMISSION

Donald S. Rich, Long Valley, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 5, 1980, Ser. No. 213,311

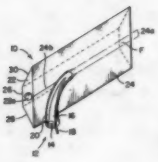
Int. Cl.³ H01B *7/08*

U.S. Cl. 174—107 **16 Claims**

1. An electrical cable assembly comprising:

(a) a coaxial cable subassembly including a central electrical conductor, an electrical insulator concentric with said central conductor and an electrically conductive sheath encircling said insulator; and

(b) a resilient body of electrically insulative material contiguously engaging said sheath over at least a major part of the circumference of said sheath and imposing radial retentive force upon said subassembly, said body having a first expanse in one direction radially outwardly of said subassembly along an axis intersecting said central conductor less than a second expanse of said body radially outwardly of said subassembly along said axis in a direction opposite said one direction, said body having a pair of opposed, manually deflectable sidewalls extending laterally outwardly of said axis, said first expanse defining a thin, rupturable retention film extending continuously with said sidewalls, said second expanse defining a deformable wall continuous with said sidewalls and about which said sidewalls are deflectable, said sidewalls being adapted to apply sufficient force to said thin retention film to rupture same upon manually deflecting said sidewalls about said deformable wall, whereby said coaxial cable subassembly may be released from said body through said ruptured film.



4,404,426

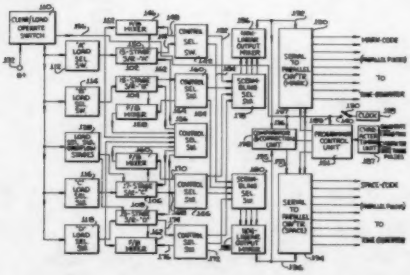
CRYPTOGRAPHIC TELEGRAPHY PROGRAMMING SYSTEM

Laurance F. Safford, Washington, D.C., assignor to American Standard Inc., New York, N.Y.

Filed May 23, 1962, Ser. No. 197,203

Int. Cl.³ H04L *9/00;* **G05B** *1/00;* **G06F** *7/02*

U.S. Cl. 178—22.03 **63 Claims**



1. Apparatus for producing multiple combinations of parallel output binary signals for controlling an anti-jam or other form of telegraphy system comprising four parallel feedback shift registers, a pair of serial to parallel converters, each having an input terminal, means for combining the output signals of said shift registers for producing two separate serial signals, means for coupling one of said serial signals to the input terminal of one of said converters, means for coupling the other of said serial signals to said input terminal of the other of said converters and means for changing the output signal of one of said

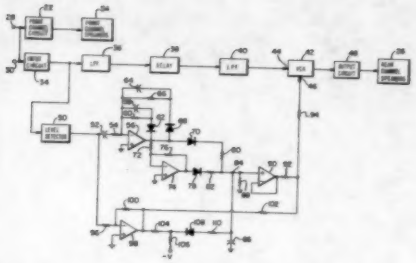
converters when said separate signals are identical for a predetermined number of binary digits, said feedback shift registers having pluralities of separate stages and a feedback mixer having input terminals connected to the last and certain other three of said stages, and an output terminal connected to the first of said stages.

4,404,427

AUDIO SIGNAL PROCESSING SYSTEM

David E. Blackmer, Wilton, N.H., assignor to Kintek, Inc., Newton, Mass.

Filed Nov. 30, 1979, Ser. No. 98,972
Int. Cl.³ H04B *3/04*; G10H *1/02*
U.S. Cl. 179—1 VL **15 Claims**



1. An audio signal processing system of the type for generating ambient effects, said system comprising:

at least two channels for respectively transmitting an audio signal to at least two speakers so that one of the speakers reproduces sound in response to the audio signal at a predetermined delay with respect to the other of said speakers;

means responsive to the signal level of said audio signal for producing a gain control signal as a function of the derivative of the signal level of said audio signal; and

gain control means electrically connected to receive the audio signal being transmitted to said one speaker for controlling the signal gain impressed on the audio signal being transmitted to said one speaker as a function of said gain control signal;

wherein said gain control means provides (A) gain reduction on (1) impulse noise transmitted in the channel for transmitting said audio signal to said one speaker and (2) audio signals of a first kind transmitted in said channel for transmitting said audio signal to said one speaker and adapted to be reproduced by said other speaker in a localized manner, and (B) signal expansion on audio signals of a second kind transmitted in said channel for transmitting said audio signal to said one speaker and adapted to be reproduced by said at least two speakers with a spatial depth.

4,404,428

DETECTOR FOR SUB SIGNAL OF MODULATED AM STEREOPHONIC SIGNAL

Hitoshi Hirata, and Akira Nishioka, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

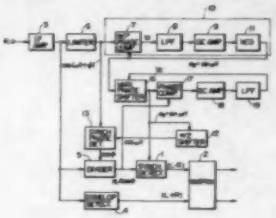
Filed Feb. 6, 1981, Ser. No. 232,270
Claims priority, application Japan, Feb. 7, 1980, 55-13963
Int. Cl.³ H04H *5/00*
U.S. Cl. 179—1 GS **7 Claims**

1. A detector for an AM stereophonic signal comprising:

a limiter, having an input coupled to receive an AM stereophonic IF signal, for producing an amplitude limited signal having a frequency and phase determined by a frequency and phase of said IF signal;

a phase-locked loop circuit for producing a first reference signal which is 90° out of phase with said amplitude limited signal, said phase-locked loop circuit comprising a 90° first phase comparator having a first input connected to receive said amplitude limited signal, a first low-pass filter having a input connected to an output of said 90° first phase comparator, a first DC amplifier having an input connected to an output of said first low-pass filter, and a voltage-controlled oscillator having an input connected to an output of said DC amplifier and an output connected to a second input of said 90° first phase comparator, said first reference signal being produced at said output of said voltage-controlled oscillator;

a phase correction circuit for correcting a phase of said first reference signal for producing a second reference signal having a phase substantially precisely 90° out of phase with a phase of said IF signal, said phase correction circuit comprising a variable phase shifter having a signal input connected to receive said first reference signal, a second phase comparator having a first input connected to an



output of said variable phase shifter and a second input connected to receive a signal having a phase determined by a carrier signal of said IF signal, a second DC amplifier having an input connected to an output of said second phase comparator, and a second low-pass filter having an input connected to an output of said DC amplifier and an output connected to a control input of said variable phase shifter, said second reference signal being produced on said output of said variable phase shifter;

a 90° phase shifter for producing a third reference signal by shifting a phase of said second reference signal 90°;

and demodulating circuit means receiving said IF signal and said second and third reference signals for producing a sub signal corresponding to a difference between first and second channel signals contained in said stereophonic AM signal.

4,404,429

MATCHING VOLUME CONTROL CHARACTERISTICS FOR TWO CHANNELS

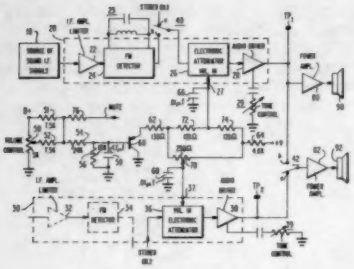
Patrick D. Griffis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1981, Ser. No. 261,362
Int. Cl.³ H03G *3/02*
U.S. Cl. 179—1 VL **10 Claims**

1. In a system for processing two channels of audio information, including first and second sources of audio information signals; first and second output terminals suitable for coupling to respective loudspeakers for reproducing said audio information; first and second amplifiers having respective inputs, and respective outputs coupled to respective ones of said output terminals; and first and second volume control means having respective audio signal inputs responsive to said first and second audio signals, respective control inputs responsive to respective D.C. control signals for controlling the volume of said reproduced audio information, and respective outputs coupled to respective inputs of said first and second amplifiers; apparatus for producing said D.C. volume control signals comprising:

a volume control potentiometer coupled across two terminals of a source of supply voltage and having a wiper arm; and

means, coupled between two terminals of a source of supply potential, for developing said D.C. volume control signals, and including a first voltage divider having a fixed tap coupled to said control input of said first volume control means, a second voltage divider coupled in parallel with said first voltage divider and having an adjustable tap coupled to said control input of said second volume control means, and an input means coupled to said wiper



arm of said volume control potentiometer for simultaneously controlling the flow of substantially equal currents through said first and second voltage dividers;

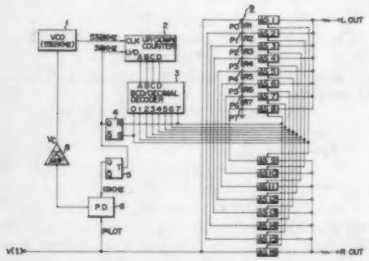
wherein said adjustable tap may be adjusted to provide compensation of any D.C. offset of the D.C. control voltage versus attenuation characteristic of said second volume control means with respect to the D.C. control voltage versus attenuation characteristic of said first volume control means.

4,404,430

FM STEREO DEMODULATION CIRCUIT WITH VOLTAGE DIVIDING AND MULTIPLEXING TECHNIQUES

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 20, 1981, Ser. No. 323,374
Claims priority, application Japan, Nov. 28, 1980, 55-167744
Int. Cl.³ H04H *5/00*; H03B *19/00*
U.S. Cl. 179—1 GE **5 Claims**



1. An FM stereo demodulation circuit comprising:

a voltage dividing network connected to receive an FM stereo composite signal which contains a pilot signal of half the frequency of a subcarrier, said voltage dividing network having plurality of outputs which provide a plurality of different voltage levels;

a first switch circuit having a plurality of analog switches for respectively coupling said outputs of said voltage dividing network to a first output terminal;

a second switch circuit having a plurality of analog switches for respectively coupling said outputs of said voltage dividing network to a second output terminal; and

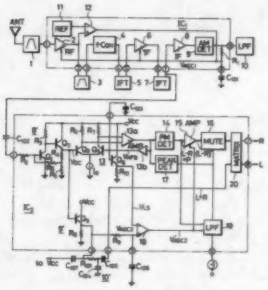
analog switch control circuit means responsive to the pilot signal for scanning said analog switches of said first and second switch circuits such that said analog switches of each of said first and second switch circuits are sequentially enabled in a reciprocating manner over one cycle period of said subcarrier and a switch scan cycle of said first switch circuit is 180° out of phase with that of said second switch circuit.

4,404,431

AM STEREO RECEIVER

Kazuo Watanabe, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,684
Claims priority, application Japan, Nov. 21, 1980, 55-163275
Int. Cl.³ H04M *5/00*
U.S. Cl. 179—1 GS **5 Claims**



1. In an AM stereo receiver, comprising:

a signal source circuit for producing a signal containing an amplitude modulation sum signal component and a phase modulation difference signal component;

an AM detector circuit connected to receive said signal from said signal source circuit for generating a signal proportional to said amplitude modulation sum signal component, including a detecting transistor formed in an integrated circuit;

a PM detector circuit connected to receive said signal from said signal source circuit for generating a signal proportional to said phase modulation difference signal component;

a variable gain circuit connected to receive said signal proportional to said phase modulation difference signal from said PM detector circuit;

a matrix circuit connected to receive the outputs of said AM detector circuit and said variable gain circuit for generating stereo reproduction signals by composing said signal proportional to said sum signal component and said signal proportional to said difference signal component received via said variable gain circuit;

means for producing an AGC voltage in response to said sum signal component obtained from said detecting transistor of said AM detector circuit;

a level shift transistor formed in said integrated circuit in which said detecting transistor is formed;

means for applying a voltage virtually equal to the base input d.c. voltage at the base of said detecting transistor to the base of said level shift transistor, thereby providing a level shift voltage from the emitter of said level shift transistor; and

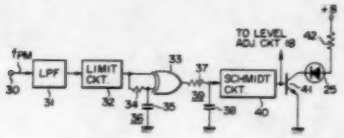
means for controlling the gain of said variable gain control circuit by a signal equal to the difference between said AGC voltage and said level shift voltage.

4,404,432

STEREO IDENTIFYING SIGNAL DETECTION DEVICE

Hiromi Kusakabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 4, 1981, Ser. No. 299,482
Claims priority, application Japan, Sep. 10, 1981, 55-125777
Int. Cl.³ H04H 5/00
U.S. Cl. 179—1 GS 3 Claims



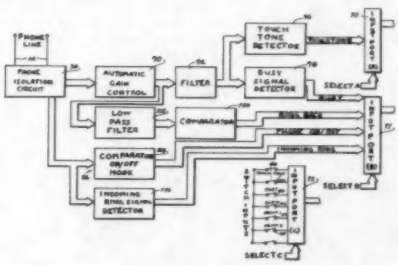
1. A stereo identifying signal detection device comprising means for extracting a stereo identifying signal from a received broadcast signal, means for limiting the level of the extracted stereo identifying signal, means for generating a pulse signal according to predetermined level variations of the output signal from said limiting means, and means for integrating said pulse signal, the output signal from said integrating means being used to switch a receiver between stereophonic and monophonic receiving modes.

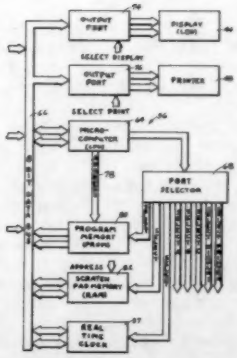
4,404,433

TELEPHONE CALL MONITORING APPARATUS

Leon Wheeler, P.O. Box 998, and Glenn A. Beusch, 128 Westwood, both of Post Falls, Id. 83854

Filed Apr. 13, 1981, Ser. No. 253,107
Int. Cl.³ H04M 15/08, 15/18, 15/22, 15/30
U.S. Cl. 179—7.1 TP 17 Claims





14. Telephone call monitoring apparatus for monitoring outgoing telephone calls from a selected telephone to determine: (1) whether the selected telephone is active or inactive; (2) the telephone numbers of called telephones; (3) the durations of completed telephone calls to the called telephones and to record the telephone numbers and the durations of the completed calls, in which the selected telephone is connected to a central telephone system by a telephone line in which the selected telephone is capable of generating a series of coded electrical signals on the telephone line to the central telephone system representing a desired called telephone number and wherein the central telephone system, in response to receiving the series of coded electrical signals, generates one or more ring back signals on the telephone line corresponding to ring signals made to the designated called telephone to generate one or more audible rings, wherein the ring back signals have a predetermined frequency, duration and period between individual ring back signals, and wherein the central telephone system generates a busy signal on the line when the called telephone is active, said apparatus comprising

connecting means operativey connecting the apparatus to the telephone line to receive the signals;

status means for determining whether the calling telephone is active or inactive;

clock means for determining the time of day that the calling telephone is active;

decoding means responsive to the series of electrical signals representative of the desired called telephone number when the calling telephone is active for decoding the series of electrical signal and generating decoded electrical signals corresponding to the desired called telephone number;

ring back signal detection means responsive to the frequency, duration and period between the ring signals for determining when valid ring back signals are generated and then terminated on the line and for generating a telephone answered signal in response thereto;

call duration means responsive to the ring signal detention means and the status means for determining the lapsed time between the generation of the telephone answered signal and the calling telephone become inactive to estimate the duration of the telephone call to the calling telephone;

a busy signal means for determining when a busy signal is generated on the telephone line; and

recording means operatively connected to the decoding means, the clock means and the call duration means for recording the telephone numbers of the called telephones and the estimated durations of the completed telephone calls to the called telephones and information that the telephone call was not completed because the called telephone was busy and the time of day in which the busy call was made.

4,404,434

COLLAPSIBLE STEREOPHONE

Thomas E. Pelt, Greenfield, and Joseph C. Besasie, Milwaukee, both of Wis., assignors to Koss Corporation, Milwaukee, Wis.

Filed Aug. 10, 1981, Ser. No. 291,248
Int. Cl.³ H04M 1/05
U.S. Cl. 179—156 R 2 Claims

1. A stereophone, the combination comprising:

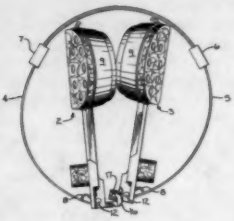
a flexible headband formed in an arc to fit over the head of a user and having a pair of ends;

a first cup assembly pivotally attached to one end of said headband for pivoted motion between an operating position in which it extends downward from the headband over the ear of a user and a transport position in which it is folded upward and within the arc formed by the headband;

a second cup assembly pivotally attached to the other end of said headband for pivotal motion between an operating position in which it extends downward from the headband over the other ear of a user and a transport position in

which it is folded upward and within the arc formed by the headband; and

fastening means for holding the ends of the headband together when both cup assemblies are pivoted to their



transport positions to thereby substantially enclose them within the headband, said fastening means including a hook formed adjacent one end of the headband and an eye formed near the other end of the headband.

4,404,435

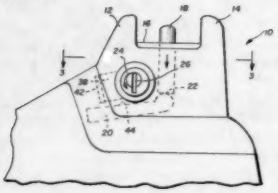
TELEPHONE LOCK

John J. Bonacci, and Theresa S. Bonacci, both of 368 True Hickory Dr., Rochester, N.Y. 14615

Filed Dec. 7, 1981, Ser. No. 328,379

Int. Cl.³ H01M *1/66*

U.S. Cl. 179—189 R **5 Claims**



1. In a telephone instrument of the type including a housing, a line switch within said housing movable between a connect position and a disconnect position, means biasing said line switch to said connect position, and handset receiving means outside said housing operative to urge said line switch to said disconnect position when a handset in place on said receiving means, the improvement for securing said instrument comprising:

a lock having a cylinder extending through said housing; and

means within said housing connected to said cylinder for engaging said line switch when said cylinder is in a locked position and holding said line switch in said disconnect position when said handset is removed from said receiving means.

4,404,436

PUSH-PUSH MECHANISM OF PUSHBUTTON OPERATING SHAFT

Hiroki Ohba, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

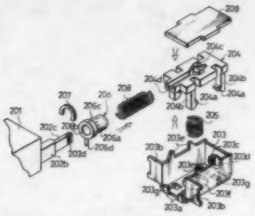
Filed Nov. 19, 1981, Ser. No. 323,034

Claims priority, application Japan, Nov. 19, 1980, 55-166012[U]

Int. Cl.³ H01H *3/12*

U.S. Cl. 200—153 J **3 Claims**

1. A mechanism for holding a pushbutton operating shaft in a latched condition and later enabling the shaft to be released from its latched condition, comprising a tubular driving member supported rotatably upon the operating shaft and provided with a protuberance extending orthogonally to the direction of axial movement of said operating shaft, means including a cam plate having an upper surface formed with a heart-shaped groove adapted to receive said protuberance for holding the operation shaft in its latched position and later enabling it to be released therefrom, a frame member receiving said cam plate therein so that the latter can move vertically while being



guided by an inner wall of the former, and means urging said cam plate upwardly within said frame member, said operating shaft being latched in a depressed state by the cooperation between said protuberance and said heart-shaped groove by holding an end of said protuberance in engagement with said heart-shaped cam groove.

4,404,437

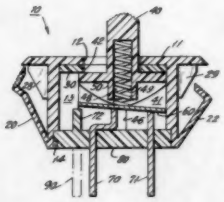
MOLDED SNAP-IN SWITCH HAVING MOVABLE CONTACT BLADE WHICH USES COMPOUND MOTION

Thomas J. Quigley, Newtown, Pa., assignor to Continental-Wirt Electronics Corporation, Southampton, Pa.

Filed Sep. 11, 1981, Ser. No. 301,150

Int. Cl.³ H01H *15/02*

U.S. Cl. 200—16 C **9 Claims**



1. A snap-acting slide switch comprising:

an elongated sliding contact blade slidably movable along its length;

a contact blade carrier; means pivotally connecting said blade to said carrier for rotation about an axis of rotation which is fixed to said carrier and which is in the plane of said blade and perpendicular to the direction of movement of said blade;

a fixed central conductive terminal member having a first support portion which slidably receives one surface of said sliding contact blade;

a fixed end conductive terminal having a second support portion which is spaced from said first support portion of said central terminal member and is disposed along the direction of movement of said sliding contact blade;

a stop member having a third support portion which is spaced from said first support portion on the side thereof opposite to said second support portion and disposed along the direction of movement of said contact blade;

said elongated contact blade having a length at least equal to the distance between said second and third support portions;

a biasing means connected to said sliding contact blade at its

said axis of rotation and pressing said blade against said first support portion;

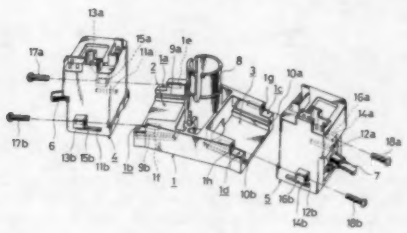
said first support portion being disposed above the extension of a straight line extending between said second and third portions whereby, when said axis of rotation of said blade slides to one side of said first support portion, said blade rotates with snap action about said axis to engage said second support portion and, when said blade slides to the opposite side of said first support portion, said blade rotates with snap action about said axis to engage said third support portion.

4,404,438

STRUCTURE FOR MOUNTING COLUMN SWITCHES FOR VEHICLES

Kazumi Honjo, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 357,909
Claims priority, application Japan, Mar. 3, 1982, 57-33249
Int. Cl.³ H01H *9/02*
U.S. Cl. 200—61.54 **9 Claims**



1. A mounting structure for mounting a column switch on a handle shaft of a vehicle, comprising the combination of:

a base board defining at least one generally U-shaped depression therein formed by a bottom member and a pair of opposed side walls, each having an inner side and an outer side, generally outwardly extending from said base board when said base board is fixed on the handle shaft of the vehicle, said depression being structurally adapted to receive a column switch therein, the inner sides of each of said side walls of said depression defining guide grooves on opposed interior portions thereof located so as to face each other inwardly, said U-shaped depression further having at least one opening therein for receiving a fastening member;

a column switch which includes a housing defined at least by opposed left and right walls thereof, and including guide projections on the respective left and right walls thereof for engaging said guide grooves in said U-shaped depression when said column switch is inserted in said U-shaped depression, said switch further defining at least one opening therein located in register with the opening in said U-shaped depression when said column switch is located therein, for also receiving said fastening member; and

a fastening member extending through one of either of said opening in said U-shaped depression or said opening in said switch to engage securely the other of said openings,

whereby said column switch is securely fixed by said fastening member to said base board.

4,404,439

METHOD AND CONSTRUCTION FOR VEHICLE BRAKE PEDAL AND SWITCH ASSEMBLY

John D. Leighton, 664 Redgate, Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 16,434, Mar. 1, 1979, Pat. No. 4,297,550. This application Jul. 29, 1981, Ser. No. 287,882
Int. Cl.³ H01H *3/14*
U.S. Cl. 200—61.89 **7 Claims**

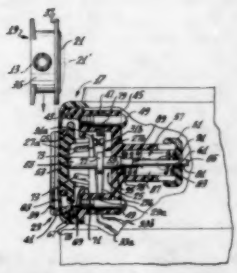
1. A signal mechanism for a pedal operated device comprising an actuating element for said device, a pedal pad detachably connected to said actuating element, first and second relatively movable signal parts carried by said pedal pad and having first and second relative positions for providing a signal in one of said relative positions, said pedal pad having a portion adaptable to be engaged by the foot of an operator, said first signal part being affixed for movement with said pedal pad portion, said pedal pad portion being movable relative to said actuating element upon actuation by the foot of an operator before said actuating element is operated to actuate said device, and means for moving said second signal part relative to said first signal part between its first relative position and its second relative position upon movement of said pedal pad portion relative to said actuating element.

4,404,440

APPARATUS FOR DETECTING WHEN THE PRESSURE DETECTOR IN A FLUID LINE EXCEEDS A PRESCRIBED THRESHOLD

William W. Busche, San Diego, Calif., assignor to IVAC Corporation, San Diego, Calif.

Filed Dec. 15, 1980, Ser. No. 216,764
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 R **19 Claims**



1. Apparatus for detecting the pressure in a fluid line, comprising:

a pressure diaphragm communicating with a fluid line and having a flexible membrane that is movable in accordance with the pressure in the fluid line;

a frame having means for removably retaining the pressure diaphragm in a prescribed position;

follower means mounted on the frame and movable in accor-

dance with the position of the pressure diaphragm and the flexible membrane thereof; and

first and second electrical contact assemblies mounted on the frame and movable with respect to each other in accordance with movement of the follower means, the two contact assemblies providing a binary electrical signal, wherein the signal is in a first state whenever the pressure diaphragm is not retained in its prescribed position and whenever the pressure diaphragm is retained in its prescribed position and the pressure in the fluid line exceeds a prescribed threshold, and wherein the signal is in a second, opposite state whenever the pressure diaphragm is retained in its prescribed position and the pressure in the fluid line does not exceed the prescribed threshold.

4,404,441

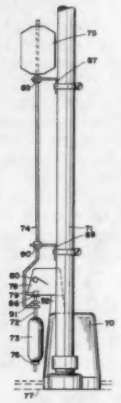
SWITCHING DEVICE WITH SEPARATE SWITCHING AND ACTUATOR RODS

David S. MacLaren, West Hill Dr., Gates Mills, Ohio 44040

Continuation of Ser. No. 185,321, Sep. 9, 1980, abandoned. This application Jun. 14, 1982, Ser. No. 387,791

Int. Cl.³ H01H *35/18*

U.S. Cl. 200—84 C **15 Claims**



1. A switching mechanism for a fluid pump comprising a switching rod having upper and lower end portions, said switching rod being movable between first and second vertical positions, a float stopper affixed to said lower end portion of said switching rod, a float slidingly connected to said switching rod above said float stopper, said float having a positive buoyancy when substantially in the fluid to be pumped and a weight when substantially out of the fluid to be pumped, an actuating snubber affixed to said upper end portion of said switching rod above said float, switching means for said switching rod to switch electricity, said switching means actuating in said first vertical position of said switching rod, magnetic means supporting said switching rod in said first vertical position when said float is substantially in the fluid to be pumped but not sufficient for supporting said switching rod when said float is substantially out of the fluid to be pumped, an actuator rod having upper and lower end portions, support means to slidingly support said actuator rod for movement between first and second vertical positions, a compensating part affixed to said upper end portion of said actuator rod, said positive buoyancy of said float being sufficient to float said switching rod, said actuator rod and said compensating part when said compensating part is substantially in the fluid to be pumped but not sufficient to float said switching rod, said actuator rod and said compensating part when said compensating part is substantially out of the fluid to be pumped, said lower end portion of said actuator rod being slidingly connected to said switching rod between said float and said actuating snubber, the entrance of said float in the fluid to be pumped causing said float to rise and engage said lower end portion of said actuator rod with insufficient force to move said actuator rod to said first vertical position and the entrance of said compensating part in fluid enabling said float to move said actuator rod and switching rod to said first vertical positions to actuate said switching means for said switching rod to switch electricity, removal of the fluid from said compensating part moving said lower end portion of said actuator rod and said float away from said actuating snubber and removal of the fluid from said float causing said float to bear on said float stopper creating a weight greater than the supporting abilities of said magnetic means supporting said switching rod in said first vertical position which causes said switching rod to move vertically to said second position to deactuate said switching means for said switching rod to switch electricity.

4,404,442

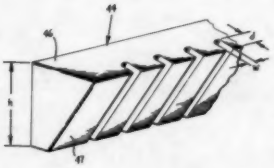
CIRCUIT INTERRUPTER HAVING FLASH PLATES WITH INTERRUPTED SURFACES

Frederick A. Stich, Milwaukee, Wis.; John D. Kleinecke, Wichita Falls, Tex., and Roger L. Robertson, Slidell, La., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Dec. 29, 1980, Ser. No. 220,374

Int. Cl.³ H01H *33/02*

U.S. Cl. 200—144 R **1 Claim**



1. In a circuit interrupter having separable contact means for breaking a circuit, operator means for causing said contact means to separate, an arc chute adjacent said contact means and enclosing a plurality of substantially parallel, insulative barrier plates having notches at the ends thereof adjacent said contact means, and a pair of substantially parallel flash plates disposed upon opposite sides of said contact means, the confronting surfaces of said flash plates being inclined so that the edges of said flash plates closest to said barrier plates are closer together than the edges of the flash plates remote from said barrier plates, said confronting surfaces of said flash plates being interrupted by a plurality of grooves extending in a direction generally perpendicular to a line extending between said contact means, the ratio of depth to width of said grooves being sufficient to prevent the accumulation of deposits resulting from the occurrence of arcs between said flash plates.

4,404,443

ELECTROMAGNETIC RELAY

Daniel Coynel, and Maurice Roussigne, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 2, 1981, Ser. No. 308,170

Claims priority, application France, Oct. 3, 1980, 80 21224

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—147 A **8 Claims**

1. An electromagnetic relay comprising:

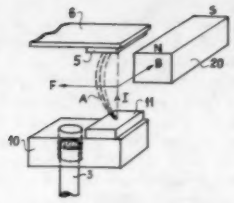
a base traversed by connection rods;

at least one fixed contact supported by a metallic member welded to one end of a connection rod, said fixed-contact support member being designed in the form of a solid block provided with a hollowed-out portion for receiving the end of the corresponding connection rod;

at least one strip subjected to an actuating element, the fixed

contact being operatively associated with a corresponding contact located at one end of the movable strip;

means for extinguishing the electric arc by lengthening said arc, said means being provided in the case of each pair of



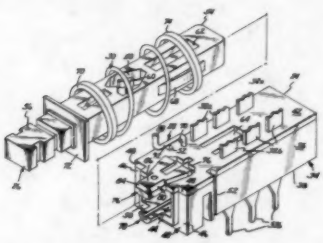
associated contacts in which one contact is fixed and the other contact is movable with at least one permanent magnet for producing a magnetic field in a direction at right angles to the direction of the current which flows between said associated contacts.

4,404,444

CONVERTIBLE ALTERNATE ACTION/MOMENTARY PUSHBUTTON SWITCH

Dwayne R. Kinney, Minnetonka, and Herman H. Sinn, Rockford, both of Minn., assignors to Electronic Components Groupe, Inc., Minneapolis, Minn.

Filed Feb. 4, 1982, Ser. No. 345,620
Int. Cl.³ H01H *13/56*
U.S. Cl. 200—153 J **17 Claims**



1. A pushbutton switch mechanism selectively capable of either momentary or alternate-action operation, the pushbutton switch mechanism comprising:

a housing including first and second generally parallel side walls, a bottom, and a top which define a longitudinal slider cavity which is open at a first end of the housing; the housing further including a lower tongue portion which extends outward from the first end; the top including an upper tongue which extends outward from the first end, which is generally parallel to and is spaced above the lower tongue, and which carries a vertical pivot hole which extends through the upper tongue; the top cover further including a longitudinally extending top opening which communicates with the cavity and which is connected to the pivot hole; and the top further including a raised cover connected to the upper tongue and covering a portion of the top opening;

an elongated slider adapted for actuating a switch, the slider extending between the upper and lower tongues and into the longitudinal slider cavity and being slidable along a longitudinal axis defined by the longitudinal slider cavity, the slider having an outer portion located outside the cavity and having an inner portion located within the cavity; the outer portion of the slider having a shoulder which is normally longitudinally spaced from the first end of the housing; inner portion of the slider having a heart-shaped cam groove in an upper surface of the slider which defines a pair of rest positions of the slider, the heart-shaped cam groove being located on the upper surface of the inner portion of the slider so that at least a portion of the heart-shaped cam groove is normally positioned below the top opening;

a removable alternate-action stop member having an upturned pivot leg, a downturned detent leg parallel to the pivot leg, and a crosspiece extending between and connecting the pivot leg and the detent leg; wherein the stop member is positioned with the pivot leg extending upward through the vertical pivot hole so that an upper end of the pivot leg is above the upper tongue and so that the stop member is permitted to pivot about a vertical pivot axis defined by the pivot hole, with the detent leg extending downward so that a lower end of the pivot leg extends into and cooperates with the heart-shaped cam groove, and with the crosspiece movable in a side-to-side arc in the top opening as the slider moves along the longitudinal axis and the lower end of the detent leg follows the heart-shaped cam groove; and wherein the stop member is selectively removable to permit momentary operation of the pushbutton switch mechanism; and

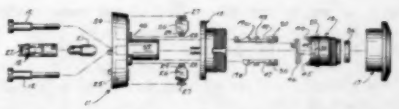
a helical compression spring surrounding the slider and extending between the shoulder on the slider and the first end of the housing to provide a longitudinal slider bias force tending to bias the slider outward, the helical compression spring having a first end which surrounds at least a portion of the upper and lower tongues and which abuts the upper end of the pivot leg to apply a generally longitudinal stop member bias force tending to bias the lower end of the detent leg of the stop member into engagement with the heart-shaped cam groove.

4,404,445

PUSHBUTTON SWITCH OPERATOR ASSEMBLY

Michael S. Baran, St. Francis; Arthur J. Felber, Muskego, and Gary C. Fillus, South Milwaukee, all of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Jul. 30, 1982, Ser. No. 403,595
Int. Cl.³ H01H *9/16, 13/62*
U.S. Cl. 200—314 **8 Claims**



1. A pushbutton switch operator assembly comprising:

a supporting, apertured base slidably receiving an axially movable switching member having a longitudinal cam profile, said cam profile defining first and second longitudinal operating switch positions;

spring-biased detent means engageable with said cam profile for alternatively maintaining said switching member in one of said first and second switch operating positions;

a manually operable actuator adapted for axial and rotatable movement relative to said base, and arranged to retain and rotatably receive said switch member;

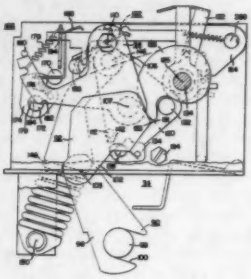
cam means between said base and said actuator for providing axial movement to said actuator concurrently with manual rotation of the actuator;

whereby said actuator may be manually moved axially in a direction away from said base either by rotative operation under the action of said cam means, or alternatively, by a manual pulling action on said actuator to thereby, in either case, cause said retained switch member to move longitudinally against the biasing action of said detent member.

4,404,446
STORED ENERGY CIRCUIT BREAKER WITH A CAM LATCH

Alfred E. Maier, and Louis N. Ricci, both of Chippewa, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1981, Ser. No. 324,298
Int. Cl.³ H01H 9/20
U.S. Cl. 200—320 5 Claims

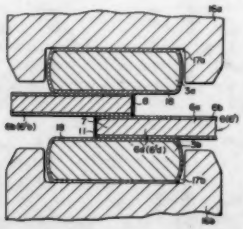


1. A circuit breaker comprising:
a stationary contact;
a movable contact operable between open and closed positions with respect to said stationary contact;
movement effecting means for effecting relative movement of said movable contact between said open and closed positions, said movement effecting means including a rotatable cam having a cam pin fixedly secured thereto and extending outwardly therefrom; and
releasable latch means for controlling closing operation of said movement effecting means, said latch means contacting said cam pin and preventing closing operation of said movement effecting means until said latch means are released;
said cam pin capable of contacting said latch means at a second location thereof to set said latch means in the latching position.

4,404,447
METHOD OF MANUFACTURING A WELDED CAN BODY

Yoichi Kitamura; Hisashi Hotta, both of Yokohama; Chikara Yurita, and Makoto Ito, both of Kawasaki, all of Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,330
Claims priority, application Japan, Apr. 22, 1980, 55-52370; Apr. 22, 1980, 55-52371
Int. Cl.³ B23K 11/32
U.S. Cl. 219—64 10 Claims

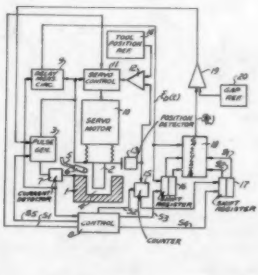


1. In a method of manufacturing a welded can body from a surface treated steel sheet selected from the group consisting of a tinplate with a tin-iron alloy plated steel sheet, said method including overlapping opposite marginal portions of a blank of said surface treated steel sheet to form a can body preform having an overlapping portion, said opposite marginal portions having cut edges, and disposing said overlapping portion between a pair of wire electrodes supported by a pair of supporting electrodes for electrical resistance seam welding, the improvement which comprises:
providing as said wire electrodes a pair of wire electrodes each having a flat surface facing said overlapping portion, and covered with metallic tin;
applying at least to the cut edges of said marginal portions of said blank a fluxing agent promoting wetting of steel with molten tin;
bringing said flat surfaces of said wire electrodes into contact with said overlapping portion; and
conducting said electrical resistance seam welding in a non-oxidizing atmosphere to form a welded portion, whereby tin transferred from the surfaces of said wire electrodes covers an extruded weld portion and a remaining cut edge surface portion of said welded portion.

4,404,448
PROCESS AND APPARATUS FOR GAP CONTROL OF AN EDM APPARATUS

M. Bernard Bommeli, Dully, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Jul. 20, 1981, Ser. No. 284,774
Claims priority, application Switzerland, Jul. 30, 1980, 5802/80
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 G 4 Claims



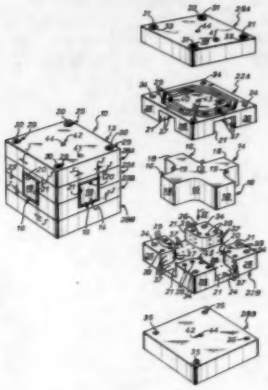
3. An apparatus for machining by electrical discharges an electrode workpiece by means of an electrode tool, wherein a machining fluid having electrically conductive particles in suspension therein is introduced in a machining gap between said electrodes and consecutive voltage pulses are applied across the electrodes for triggering said electrical discharges, said apparatus comprising a voltage pulse generator connected across the electrodes, a servo motor for displacing one electrode relative to the other in response to machining conditions, first means associated with said pulse generator for effecting at least two measurements of the average value of electrical discharge triggering delay while maintaining the concentration of particles in suspension in said machining fluid at a constant value, second means associated with said servo motor for effecting at least two measurements of the corresponding width of the gap between said electrodes, and means co-operating with said first and second means for calculating the instantaneous value of the average triggering delay according to a predetermined linear function between the inverse of the gap and the logarithm of the average triggering delay.

4,404,449

TRANSMISSION DEVICE AND MACHINE TOOL COMPRISING SAME

Jean-Francois Astier, Boisseuil-Feytiat, and Louis Bessaguet, Limoges, both of France, assignors to Legrand, Limoges, France

Filed Mar. 19, 1982, Ser. No. 350,238
Claims priority, application France, Feb. 23, 1981, 81 03511
Int. Cl.³ B23P 1/08; B06B 3/00
U.S. Cl. 219—69 V 17 Claims



1. A transmission device designed to be placed between a first member, hereinafter referred to as the driving member, and a second member, hereinafter referred to as the driven member, said device comprising a hollow casing and a core member disposed in said casing and free to move therein in all directions, said core member having at least two arms with a non-aligned angular relationship to one another and extending to the outside of said casing and to each of which either said driving member or said driven member may be connected, said casing incorporating an internal housing with a configuration which is a homothetic replica of the configuration of said core member, with clearance between said core member and said housing in all directions, walls with at least part of each wall facing a respective one of said arms of said core member being formed with a recess or hole, and a network of internal conduits whereby each of said recesses or holes can communicate with a source of pressurized supporting fluid.

4,404,450

ROLL WELDING MACHINE AND METHOD OF RECONDITIONING CASTER ROLLS

John F. Weldon, 7473 Pebble Pointe, West Bloomfield, Mich. 48033

Filed Jan. 11, 1982, Ser. No. 338,391
Int. Cl.³ B23K 9/04
U.S. Cl. 219—76.12 23 Claims

1. A roll welding machine comprising a frame mountable upon a support surface;

a power driven head stock mounted on said frame;

a tail stock mounted on said frame for longitudinal adjustment relative to head stock, said headstock and tail stock defining a longitudinal axis and axially mounting an elongated steel caster roll having a crack therein;

an elongated gas manifold having a series of longitudinally spaced burner outlets, connected to a gas source under pressure spaced below said axis and underlying said roll for maintaining said roll at a predetermined temperature;

an upright support of inverted U-shape parallel to and laterally spaced from said axis, secured to said frame and including front and rear standards adjacent said heat stock and tail stock respectively;

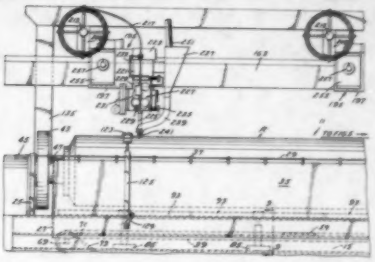
a pair of upright slide carriers slidably mounted upon said standards adapted for vertical adjustments thereon;

a cross support interconnecting said carriers;

a pair of spaced interconnected cross slide beams within said upright support extending at right angles to said axis and adjustably mounted upon said cross support for movements transversely of said axis;

a support beam spaced above and parallel to said axis and interconnecting the inner ends of said cross slide beams with its ends projection outwardly of said standards;

a travel carriage guidably and movably mounted upon said support beam along its length spaced above and parallel to said axis;



a welding head assembly mounted upon and depending from said travel carriage having a tubular electrode holder outletting adjacent said roll;

a welding wire drive feed head upon said welding head assembly for feeding welding wire through said electrode holder into registry with said roll;

and a coil of welding wire journalled upon said carrier adapted for continuously delivering welding wire to said drive feed head;

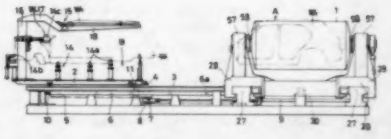
said welding head assembly being adjustable horizontally and vertically relative to said axis, and longitudinally movable reciprocally along the length of said roll, with intermittent rotation of said roll along said axis.

4,404,451

WELDING APPARATUS FOR MOTORCAR BODY

Ryo Niikawa, and Susumu Wakou, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,572
Claims priority, application Japan, May 29, 1980, 55-70786; May 29, 1980, 55-70787; Jul. 4, 1980, 55-90572
Int. Cl.³ B23K 37/04, 9/12
U.S. Cl. 219—80 4 Claims



1. A welding apparatus for a motorcar body which includes a floor panel, a roof panel, and a pair of left and right-side panels, each having component parts, which comprises:

a setting station,

a combining station displaced from said setting station along a longitudinal axis;

a pair of welding jig means positioned on opposing sides of said combining station for moving said pair of side panels to said combining station and for holding said side panels

in a desired position at said combining station, said pair of welding jig means being moveable laterally of said axis; and

carrier means moveable along said axis from said setting station to said combining station for simultaneously moving both said roof panel and said floor panel from the setting station to the combining station and for positioning and holding both said roof panel and said floor panel in desired positions at said combining stations.

4,404,452

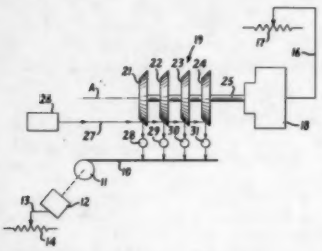
OPTICAL PERFORATING APPARATUS AND SYSTEM

Ernest Cashwell, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 46,808, Jun. 8, 1979, abandoned. This application May 6, 1982, Ser. No. 375,741

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LK 6 Claims



1. Apparatus for perforating a web of sheet material comprising:

means for generating a beam of optical energy;

an assembly rotatable about a rotational axis parallel to the axis of said beam, said assembly including:

first and second light reflective means supported in immediate spaced succession along said rotational axis, said first light reflective means having first cupped light reflective elements arranged in a first locus about and at a non-orthogonal attitude to said rotational axis, said second light reflective means having second cupped light reflective elements arranged in a second locus about and at a non-orthogonal attitude to said rotational axis;

said first light reflective means further having first light transmissive portions each situated on said first locus between mutually disposed ones of said first light reflective elements and being disposed such that each of said first light transmissive portions is in registry with a corresponding one of the second cupped light reflective elements of said second light reflective means;

said rotational axis being spaced from said beam axis such that as the assembly rotates about said rotational axis the beam is successively alternately reflected by the first and second light reflective elements; and

means for transporting a web of sheet material in light receiving relation to said first and second reflective means and in parallel relation to said rotational axis.

4,404,453

LASER BONDING OF MICROELECTRONIC CIRCUITS

Alexander Gotman, Santa Monica, Calif., assignor to Asta, Ltd., Irvine, Calif.

Filed Sep. 10, 1981, Ser. No. 300,991

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LD 6 Claims

1. The method of attaching a semiconductor chip to a substrate to form an electrical assembly, comprising the steps of:

(a) selecting a semiconductor chip having a plurality of metallic electrical connectors protruding therefrom;

(b) selecting a substrate having a substantially sheet-like configuration;

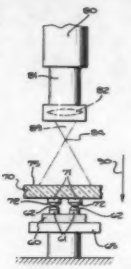
(c) selecting a plurality of conductive metallic members and securing them in such locations on one surface of the substrate as to receive respective connectors of the chip;

(d) then tinning both the connectors of the chip and the metallic members of the substrate;

(e) generating a laser beam having a wave length to which the substrate is substantially opaque;

(f) de-focusing the laser beam;

(g) then directing the de-focused laser beam upon the opposite surface of the substrate throughout an area which



encompasses all of the metallic members, so as to heat the substrate and thereby heat the metallic members;

(h) then, while continuing to direct the de-focused laser beam upon the substrate, moving the chip and the substrate together so as to bring each electrical connector of the chip into contact with the corresponding metallic member of the substrate;

(i) continuing to direct the beam upon the substrate until the tinned surface of each electrical connector becomes fused to the tinned surface of the associated metallic member; and

(j) then interrupting the laser beam and cooling both the chip and the substrate so that the fused contacts become permanently bonded together.

4,404,454

LIGHT ENERGY PERFORATION APPARATUS AND SYSTEM

George W. B. Taylor, Richmond, Va., and Richard B. Barber, Ann Arbor, Mich., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 944,081, Sep. 20, 1978, abandoned. This application Feb. 19, 1982, Ser. No. 350,275

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LK 9 Claims

1. Apparatus for generation of pulsed light beams from a continuous light beam for perforating a moving web at certain predetermined spaced-apart locations, comprising:

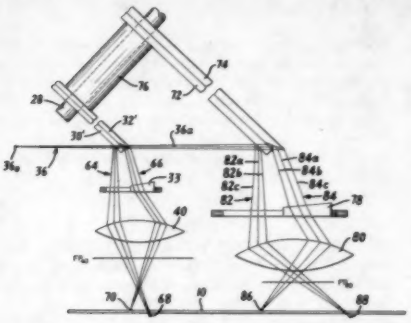
(a) first reflective means arranged to receive said continuous beam and supported for rotation about a preselected rotational axis, said first reflective means including a first disc

(1) having light reflective facets mutually spaced in a circular locus about the periphery of said disc to confront said continuous beam individually in the course of rotation of said first disc, each of said light reflective facets being disposed in a mutually identical first attitude with respect to said rotational axis, and

(2) having apertures between adjacent said light reflective facets to define light transmissive portions;

(b) second reflective means disposed mutually contiguously with said first reflective means, said second reflective

means including a second reflective disc having light reflective facets mutually spaced in a circular locus about the periphery of said second disc to confront said continuous beam individually in the course of rotation of said second disc, said light reflective facets of said second disc each being disposed in a mutually identical second attitude diverse from said first attitude with respect to said rotational axis, said second disc further having apertures between adjacent said light reflective facets to define light transmissive portions, said light reflective facets and said apertures of said second disc being in alignment respectively with said apertures and said light reflective facets of said first disc, whereby first and second pulsed light beams issue successively alternately from said first and second



discs, said diverse dispositions of said light reflective facets on said first and second discs cooperating to cause divergence of the paths of said first and said second pulsed beams;

(c) common focusing means for receiving said first and second pulsed light beams issuing from said first and second discs and focusing said pulsed beams at first and second predetermined spaced-apart locations on said moving web; and

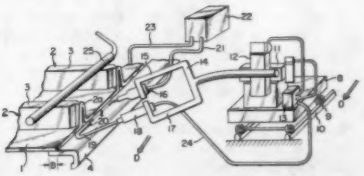
(d) light deviating means disposed between said second disc and said common focusing means for controlling the path of said second beam to said common focusing means, and thereby controlling the spacing of said second location relative to said first location on said moving web.

4,404,455

AUTOMATIC WELDING APPARATUS WITH WELD LINE DETECTING MEANS

Tohru Gotoh, Kasugai, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,742
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 **4 Claims**



1. An automatic welding apparatus for welding two workpieces into overlapping relationship with the first workpiece having a substantially flat surface extending laterally away from the position of the overlapping a substantial distance relative to the size of the workpieces and the second workpiece lying on the first workpiece with the thickness thereof perpendicular to the flat surface of the first workpiece and having portions extending perpendicularly away from the flat surface of the first workpiece at intervals therealong and an edge lying along the flat surface of the first workpiece with the surface of the edge substantially perpendicular to the flat surface and having apertures in the edge at the portions extending perpendicularly away from the first workpiece, the apertures facing laterally of the edge along the flat surface of the first workpiece extending away from the position of the overlapping, said apparatus comprising:

a weld torch;

moving means on which said welding torch is mounted for moving said welding torch along a path parallel to the edge of the second workpiece and for moving the welding torch toward and away from the surface of the edge and toward and away from the flat surface;

a weld line detector means for engaging the flat surface of the first workpiece and the edge of the second workpiece and movable therealong for sensing a weld line along the position of overlapping and for producing an output representative of the position of the weld line, said detector means having probe consisting of a sensor extending toward the weld line and a straight portion integral with the end of said sensor and extending parallel with the weld line, said straight portion having a diameter substantially the same as the thickness of the second workpiece and being longer than the dimension of the apertures parallel to the weld line, the distance between the end of said straight portion and said welding torch being less than the distance between adjacent perpendicularly extending portions;

control means to which said weld line detector means is connected and in turn connected to said moving means for moving said moving means toward and away from the flat surface and the edge in response to said output for causing said welding torch to follow the weld line; and

a pressure means for exerting a pressure on the perpendicularly extending portions on the second workpiece, said pressure means comprising a flexible element deformable by a reactive force from the perpendicularly extending portions and positioned above the outer ends of the perpendicularly extending portions and directly engageable with the individual perpendicularly extending portions for exerting the reactive force individually thereon when the welding torch is along the weld line.

4,404,456

MICRO-ARC WELDING/BRAZING OF METAL TO METAL AND METAL TO CERAMIC JOINTS

Gordon L. Cann, P.O. Box 279, Laguna Beach, Calif. 92652

Filed Mar. 26, 1981, Ser. No. 247,770
Int. Cl.³ B23K 9/00
U.S. Cl. 219—137 PS **21 Claims**

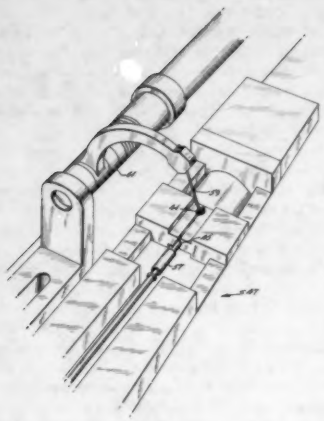
1. A method for welding a material at an anode juncture with an arc from a cathode so that at least some of the material is melted and flows together to form a unified weld, comprising the steps of

(a) determining an effective radius, the effective radius being a portion of the material which is to be heated to a desired temperature during the heating;

(b) determining the current level necessary to heat the material to the desired temperature over the effective radius at a desired gas pressure range, said current level being determined through calculation of the formula

$I =$

-continued



$$\left[\frac{A_R \epsilon a T_M^4 + A_c \phi M / L_{eff}}{\delta V_I + \chi_w}\right] \{(1-\alpha)(1-\tau a^4) + \alpha(1-\tau a)\},$$

where

I=the current level

A_R=surface area of material that will be radiating power

ϵ=emissivity of material

α=the ratio of power conducted by the arc to total power losses at an attachment point of said anode juncture

T_M=melting point of the material

A_c=cross-sectional area through which heat is conducted away from the material

ϕ=heat flux potential for the material

M=Mass of material that must be raised to the desired temperature

L_{eff}=Effective conduction length-average length over which heat is conducted

$\tau a = Ta/T_M$ where Ta=ambient temperature in °K.

δ=parameter defining a proportion of electron energy discharged at the anode attachment point of said material

V_I=ionization potential of gas or vapor near said attachment point

X_w=work function of work material, that is, energy electrons absorb upon entering the material;

(c) said current level being maintained within the range of 10 milliamps to 10 amps;

(d) determining a pressure level within said gas pressure range necessary to maintain a stable arc at the determined current level and obtain the desired penetration of the weld through calculation of the formula

$$\text{atm} = \frac{p}{p_a} = \frac{kT_M}{p_a q_{ea}}\left[\frac{27}{4}\ \frac{I}{\epsilon_0 V_I^{3/2}} A_R \sqrt{\frac{m}{2|e|}}\right]^{\frac{1}{3}},$$

where

atm=atmospheres of pressure

K=Boltzmann constant

P=pressure level

P_a=atmospheric pressure

q_{ea}=cross-section for atom electron collisions

ϵ_0=capacitivity of vacuum

m=mass of the electron

|e|=electron charge of the electron;

(e) determining a time for which the current must flow in order to heat the material at the effective radius to obtain the desired temperature;

(f) determining a cathode temperature necessary to maintain thermionic emission;

(g) determining a cross-sectional area of the cathode necessary to maintain the cathode temperature at said current value, said cross-sectional area corresponding to a cathode diameter greater than 0.0004 inches and less than 0.009 inches;

(h) positioning the material to be heated in a jig so that the portion of the material which is to be elevated to the desired temperature is in close proximity to a cathode of the determined cross-sectional area;

(i) establishing the determined pressure at the portion of the material which is to be elevated to the desired temperature;

(j) applying electrical potential across the cathode and the material to be heated to desired temperature so that the desired current flows through the cathode for a desired amount of time, the current flowing in an arc between the cathode and the material which is to be heated to the desired temperature; and

(k) maintaining the current flowing through the cathode in a stabilized condition.

4,404,457

WELDING CORE WIRE SUPPLY DEVICE

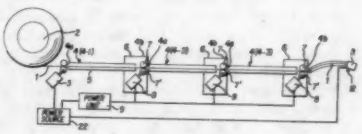
Masaharu Rokujio, Yamato; Takaaki Ogasawara, Kamakura, and Mitunori Usui, Fujisawa, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Continuation of Ser. No. 77,268, Sep. 20, 1979, abandoned. This application Apr. 27, 1982, Ser. No. 372,397

Claims priority, application Japan, Sep. 21, 1978, 53/130988

Int. Cl.³ B23K 9/12

U.S. Cl. 219—137.2 **1 Claim**



1. A welding core supply apparatus comprising:

a source of welding core wire;

means for consuming said welding core wires;

welding core wire conduit means extending between said source and said means for consuming and adapted to enclose said welding core wire, said conduit means comprising at least two conduit sections serially releasably connected together by releasable connecting means at the ends of each said section, each of said conduit sections containing at least one pair of positively driven rollers for advancing said welding core wire through said conduit means, wherein each of said conduit sections also houses a welding core wire guide tube section, a contol cable section, and a power cable section, each of said housed sections including releasable connecting means on both ends for connecting said housed sections to the housed sections of adjacent conduit sections, whereby a desired number of conduit sections may be connected together and the core wire is smoothly transported through said conduit sections by said rollers in each sections;

wherein each said conduit section includes a pull motor connected to said control cable section for rotating each of said pairs of rollers, each said pull motor including a constant motor torque control means;

a power on-off circuit and an inching circuit associated with said control cable and power cable sections for controlling said pull motors;

a pair of push rollers positioned between said source of

welding core wire and any of said conduit sections for introducing said welding core wire into said conduit means;

a push motor for rotating said push rollers; and

push motor control means actuated by said power on-off circuit and said inching circuit.

4,404,458

ATTACHMENT OF FORK FITTING TO FORK LEG

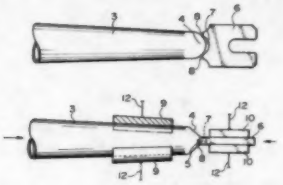
Yasuhiro Tange, Sakai, Japan, assignor to Tange Industries, Ltd., Osaka, Japan

Filed Jul. 1, 1981, Ser. No. 279,261

Claims priority, application Japan, Jul. 7, 1980, 55-93683

Int. Cl.³ B23P *13/00*; B21J *5/08*

U.S. Cl. 219—150 R **4 Claims**



1. A method for attaching a bicycle fork fitting to a fork leg comprising the steps of forming a steel pipe into a fork leg, closing the distal end of the pipe with a joint by shearing, providing a fork fitting with an indentation and a pair of projections on either side thereof at the distal end of said fitting, said indentation being the same shape as the closed distal end of said pipe but slightly smaller in its transverse dimension, butting said projections against said closed distal end of said pipe, applying two pairs of welding electrodes to said pipe and said fitting, passing electric currents by means of said electrodes through the closed portion of the fork leg and the projections of the fitting while bringing the same in contact with each other under pressure, and upsetting under greater pressure the thus integrated arrangement upon reaching a temperature suitable for welding, whereby the fitting is welded to the fork leg.

4,404,459

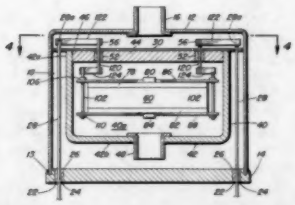
HOUSING AND MOUNTING ASSEMBLY PROVIDING A TEMPERATURE STABILIZED ENVIRONMENT FOR A MICROCIRCUIT

Donald L. Harton, Baltimore, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 19, 1981, Ser. No. 312,589

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—209 **16 Claims**



1. A housing and mounting assembly providing a temperature stabilized environment for a microcircuit, comprising: a hermetically sealed outer enclosure having a plurality of electrical feedthroughs including a plurality of electrical leads, each said electrical lead extending from a first end exterior to said outer enclosure through a feedthrough and extending a substantial distance into the interior space of said outer enclosure to a second end;

an inner enclosure having a plurality of electrical feedthroughs including a plurality of electrical leads protruding therethrough to electrically communicate between the exterior and interior of said inner enclosure;

means electrically and structurally connecting said second ends respectively to the ends of said inner enclosure electrical leads exterior to said inner enclosure so that said inner enclosure is disposed within said outer enclosure substantially between said first and second ends;

mounting means supporting said microcircuit, said mounting means including a substrate, and means for sensing the temperature of said substrate, said mounting means being disposed inside said inner enclosure and supported by said inner enclosure electrical leads; and

means controlled by said temperature sensing means for heating the heat spreader means of said substrate.

4,404,460

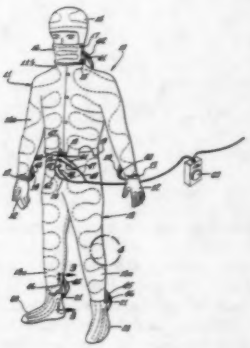
CONTROLLABLY HEATED CLOTHING

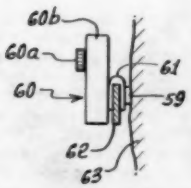
John F. Kerr, Reseda, Calif., assignor to Appleton Papers Inc., Appleton, Wis.

Filed Mar. 12, 1982, Ser. No. 357,404

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—211 **11 Claims**





1. In heated clothing, the combination comprising

(a) multiple clothing sections adapted to cover different portions of the human body,

(b) electrical wires carried by said sections and including bus wires and heater wires, said bus and heater wires being electrically insulated, and

(c) means including a temperature control connected in series with said wires for controlling battery powered electrical current flow to said bus and heater wires, and including manually operable switch means connected in series with at least one of said heater wires for interrupting

current flow thereto without requiring disconnection of bus wires,

(d) there being a temperature sensor adapted to be carried by the wearer of the clothing to sense wearer's body heating of the clothing, said sensor connected in controlling relation with said temperature control to cause an increase in current flow to said wires in response to a predetermined lowering of sensed body generated heating of the clothing,

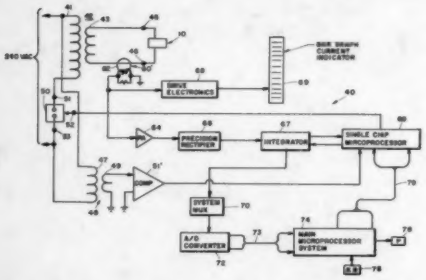
(e) and structure to contain said control and to attach the control to the wearer's clothing with the sensor carried by said structure to be exposed toward the wearer's body.

4,404,461

METHOD AND APPARATUS FOR CONTROLLING AN ANALYTICAL FURNACE

George J. Sitek, Stevensville, and Richard B. Haigh, Buchanen, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Sep. 24, 1980, Ser. No. 190,357
Int. Cl.³ H05B 1/02
U.S. Cl. 219—490 **11 Claims**



1. A control system for applying operating power to an analytical furnace for containing an analytical specimen for fusion in which the temperature of the furnace is increased in a predictable and selectable fashion for fusion of an analytical specimen such that specimen gases from different compounds are spatially released, said control system comprising:

power supply means for supplying periodically varying current;

controllable switch means coupled to said power supply means;

a furnace heating element coupled to said switch means;

storage circuit means for storing an array of predetermined memory bit patterns, each indicative of a cycle series pattern of the supply current, each comprising an array of binary bits including a predetermined number of bits corresponding to a cycle of supply current; and

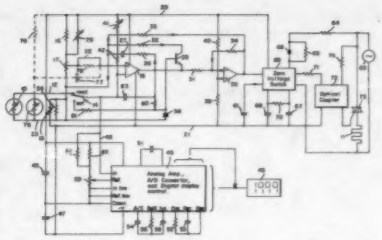
control circuit means coupled with said storage circuit means for selectively actuating said switch means according to a predetermined sequence of said memory bit patterns, each successive memory bit pattern being indicative of at least as many cycles per series pattern as the preceding memory pattern, said control means including a microprocessor for providing control signals for application to said switch means according to said predetermined sequence of said memory bit patterns whereby operating current which increases in cycles per unit time in a predetermined manner is applied to said heating element to supply increasing power to said heating element such that the temperature of said furnace is increased in a controlled fashion for fusion of an analytical specimen such that specimen gases from different compounds are spatially released.

4,404,462

UNIVERSAL TEMPERATURE CONTROL CIRCUITS

Wayne A. Murray, Sanger, Calif., assignor to Edsyn, Inc., Van Nuys, Calif.

Filed Mar. 30, 1981, Ser. No. 248,187
Int. Cl.³ H05B 1/02
U.S. Cl. 219—497 **11 Claims**



1. An electronic circuit for generating a digital output signal in response to the measured temperature of an object comprising:

(a) a temperature sensor for sensing the temperature of the object and generating a voltage signal representative of the temperature and varying non-linearly with temperature;

(b) an analog amplifier having a gain which varies with an applied reference voltage and having a reference and an input terminal;

(c) means for applying said voltage signal directly on said input terminal of said analog amplifier;

(d) a first operational amplifier acting as a comparator and having a positive and a negative input terminal;

(e) a sound operational amplifier having a positive and a negative input signal;

(f) a first negative feedback including a first resistor connected between the output and negative input of said second operational amplifier;

(g) a second, third, and fourth positive feedback for said first operational amplifier including a second resistor connected to the output of said second operational amplifier, a third feedback for said first operational amplifier including a third resistor and capacitor in series connected to the output of said first operational amplifier, a transitor having its emitter and collector connected between the output of said first operational amplifier in series with a fourth resistor, the free ends of said second, third, and fourth feedbacks being connected to a common summing point coupled in turn to the positive input terminal of said first operational amplifier, the base of said transistor being coupled to the output of said first operational amplifier and to said sensor;

(h) a first voltage divider network coupled to the positive input of said first operational amplifier, and said common summing point being connected to said first voltage divider network, whereby the voltage applied to the positive input of said first operational amplifier varies with the voltage signal;

(i) means for impressing said voltage signal directly on the negative input terminal of said first operational amplifier and on the base of said transistor;

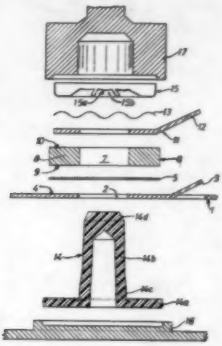
(j) means for applying an adjustable reference voltage on said input terminal of said analog amplifier and including feedback means between said reference and input terminals of said analog amplifier to generate a substantially linear analog signal impressed on said analog amplifier; and

(k) an analog-to-digital converter coupled to said analog amplifier to generate a digital output signal suitable for a digital temperature display.

4,404,463
ELECTRICAL HEATING DEVICE

Bernd Eder, Wuppertal, and Eckehard Wosthoff, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Kabelwerke Reinshagen GmbH, Wuppertal, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,730
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3048452
Int. Cl.³ H05B 3/08
U.S. Cl. 219—541 3 Claims



1. For use in heating a plate, an electrical heating device including a resistor, the improvement comprising:

a plate to be heated having an opening therein,

said resistor being an electrically resistive body having first and second flat faces on opposite sides, said body defining an opening extending from one face to the other,

the first face of said resistive body being disposed in face-to-face relation with said plate to be heated with the opening in the body aligned with the opening in the plate,

said plate constituting a first electrical terminal on the resistive body,

a second electrical terminal being disposed in engagement with the second face of the resistive body and having an opening therein,

and fastening means including,

a pin of electrically non-conductive material having a head and a shank, said shank extending through the openings in the plate to be heated, the resistive body and the second terminal,

and a press-on nut being disposed over the end of said shank urging the plate to be heated, the second terminal and the resistive body against one another.

4,404,464
METHOD AND APPARATUS FOR ELECTRICALLY CONNECTING A REMOVABLE ARTICLE, IN PARTICULAR A PORTABLE ELECTRONIC CARD

Roland C. D. Moreno, 30-32, Bvd de Strasbourg, Paris, France (75010)

PCT No. PCT/FR79/00005, § 371 Date Sep. 24, 1978, § 102(e) Date Sep. 17, 1979, PCT Pub. No. WO79/00543, PCT Pub. Date Aug. 9, 1979
PCT Filed Jan. 23, 1979, Ser. No. 169,114
Claims priority, application France, Jan. 24, 1978, 7801876
Int. Cl.³ G06K 7/01
U.S. Cl. 235—438 21 Claims

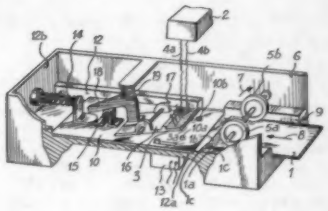
1. Method for electrically connecting a removable article having at least one electric circuit thereon, with an electric device, which cooperates with said removable article, said removable article having electrically conductive terminals and said electric device having conductor elements, both said electrically conductive terminals and said conductor elements having corresponding contact surfaces, the method comprising the steps of:

(a) bringing, respectively, said corresponding contact surfaces of said electrically conductive terminals into contacting relationship with said corresponding contact surfaces of said conductor elements;

(b) testing said corresponding contact surfaces for the existence of correct alignment and electrical contact between said corresponding contact surfaces; and

(c) displacing said corresponding contact surfaces relatively, in a direction tangential to said corresponding contact surfaces if said testing determines non-alignment and non-existence of correct electrical contact, and stopping the relative displacement of corresponding contact surfaces when said testing determines said alignment and existence of correct electrical contact.

10. Apparatus for electrically interconnecting an electric device with a removable article having at least one electric



circuit, said removable article having corresponding contact surfaces and said electric device having coresponding contact surfaces, contact between said corresponding contact surfaces serving to electrically connect said electric device with said removable article, said apparatus comprising:

(a) means for accepting said removable article in a predetermined position wherein said corresponding contact surfaces of said removable article generally correspond to said corresponding contact surfaces of said electric device;

(b) means for bringing said corresponding contact surfaces of said electric device into contacting relationship with said corresponding contact surfaces of said removable article;

(c) means for testing said corresponding contact surfaces for alignment and the existence of correct electrical contact between said corresponding contact surfaces; and

(d) means for displacing said corresponding contact surfaces relatively.

4,404,465
ARRAY POSITIONING SYSTEM

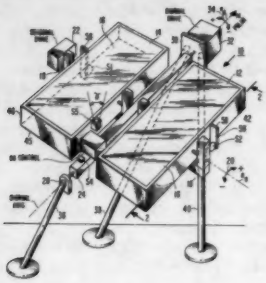
Arthur Miller, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 113,506, Jan. 21, 1980, Pat. No. 4,314,546.
This application Aug. 11, 1981, Ser. No. 292,016
Int. Cl.³ G01J 1/20
U.S. Cl. 250—203 R 2 Claims

1. In a solar tracking system including solar sensor means and control means arranged to track the sun in a diurnal cycle, said sensor means including spaced photovoltaic generator means and light diffusing means over said generator means wherein the improvement therewith comprises:

vane means adjacent each said generator means oriented and dimensioned to reduce the sensitivity of said generator means to the shadowing effect of partial obscuration of said light diffusing means by foreign matter, said diffusing

means including a hemispherical light integrating means having a given diameter, said vane means extending in



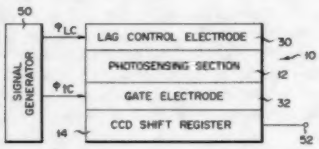
front of the hemisphere toward the sun a distance of about 2.5 times said diameter.

4,404,466

SOLID STATE IMAGE SENSOR WITH LAG CONTROL ELECTRODE

Nozomu Harada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 7, 1981, Ser. No. 251,935
Claims priority, application Japan, Apr. 17, 1980, 55-49552
Int. Cl.[3] H01J 40/14
U.S. Cl. 250—211 J 11 Claims



1. A solid state image sensor which comprises:

photosensing means for generating a signal charge in an amount corresponding to the intensity of a received picture light;

signal generating means for generating at least one electrical signal having a prescribed voltage waveform;

storage means connected to said signal-generating means for trapping a prescribed amount of the signal charge generated by said photosensing means in response to the electricl signal for a predetermined period of time; and

gate means for reading out the signal charge generated by at least said photosensing means;

wherein said photosensing means is mounted on one surface of a semiconductor substrate having one conductive type, and comprises a semiconductor layer having a conductivity type opposite to that of said semiconductor substrate; and said storage means comprises an electrode which is partly overlaid on said semiconductor layer and also connected to said signal-generating means;

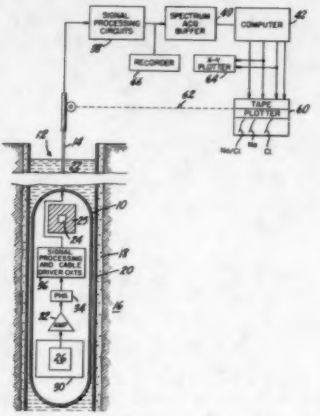
wherein said signal-generating means is formed of a signal generator for producing first and second control signals having a prescribed waveform; said storage means traps the signal charge in response to the first control signal; and said gate means allows for the readout of a signal charge generated by said photosensing means and a signal charge trapped by said storage means in response to the second control signal.

4,404,467

SALINITY AND LITHOLOGY DETERMINATION FROM THE SODIUM AND CHLORINE ACTIVATION LINES

Jeffrey S. Schweitzer, Ridgefield, Conn., and Ralph M. Tapphorn, Boulder, Colo., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,454
Int. Cl.[3] G01V 5/10
U.S. Cl. 250—270 12 Claims



1. A method for investigating the lithology and salinity of an earth formation traversed by a well bore, comprising the steps of:

(a) irradiating an earth formation with neutrons to produce therein the neutron activation reactions $^{23}Na(N,\gamma)^{24}Na$ and $^{37}Cl(n,\gamma)^{38}Cl$;

(b) selectively measuring, from among the total gamma ray activity resulting from said irradiation, the level of gamma ray activity resulting from the decay of ^{24}Na using a high resolution gamma ray detector;

(c) selectively measuring, from among the total gamma ray activity resulting from said irradiation, the level of gamma ray activity resulting from the decay of ^{38}Cl using a high resolution gamma ray detector; and

(d) combining said ^{24}Na gamma ray measurement and said ^{38}Cl gamma ray measurement to provide an indication of at least one of the lithology and salinity of the earth formation.

2. The method of claim 1 wherein the combining step comprises forming a ratio function of the ^{24}Na gamma ray measurement and the ^{38}Cl gamma ray measurement.

4,404,468

PYRODETECTOR

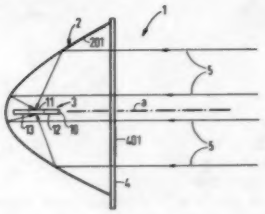
Peter Kleinschmidt, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 168,336, Jul. 14, 1980, abandoned. This application Jul. 27, 1981, Ser. No. 287,140
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1979, 2930632; Jul. 25, 1980, 3028252
Int. Cl.[3] G01J 1/00
U.S. Cl. 250—342 25 Claims

1. A pyrodetector with a sharply limited directional range of detection sensitivity for the detection of a body entering into said directional range from a distance greater than the maximum sensing distance from the detector, said body having a temperature which deviates from that of its environment, comprising: a concave mirror means for focusing thermal radiation emanating from the body; a pyroelectric first sensor

element positioned at the focus of the predetermined directional range of the mirror means and formed as a flat body comprising an electrically non-conductive material with permanent orientation polarization and which is provided with a pair of electrodes; cover means transmissive to the incident thermal radiation from the body and ambient thermal radiation and being positioned for protecting the first sensor element against damage and air drafts; at least one further sensor element comprised of the same material as the first sensor element and having substantially a same thickness so as to provide substantially identical heating time constants for the first and further elements; the further sensor element having a pair of electrodes and being located outside a focal plane of the minor means containing the focus and perpendicular to a focus axis but adjacent the first sensor element at a locus such that both the further sensor element and the first sensor element are subjected to an equal extent to the ambient thermal radiation emanating from said cover means;

the first and further sensor elements comprising central portions of a single flat body having opposite major surfaces, and a mounting means holding the single body at edges thereof;



the single flat body being aligned such that its major surfaces are parallel to and the body lies on the focus axis passing through the focus and extending in the direction of the detection range so that the first sensor and further sensor lie adjacent one another along said focus axis;

the concave mirror means having a parabolic shape and the focus lying within an inner half of the mirror;

the first and further sensor elements formed by the body absorbing only radiation reflected by the concave mirror means at the opposite major surfaces;

the electrode pairs of all sensor elements being connected to an electrical evaluation means; the pairs of electrodes each being terminated with an impedance such that a time constant K of a decay time of the sensor element

$$R_X C_X = K$$

is valid for all pairs of electrodes, wherein C_X is a capacitance of a capacitor formed from the respective pair of electrodes, R_X is a respective terminating impedance, and $K < 10$ seconds; and an electronic evaluation means for forming a difference between an output signal of the first and of the further sensor elements.

4,404,469

REAL-TIME 3-D X-RAY AND GAMMA-RAY VIEWER

Lo I. Yin, Silver Spring, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

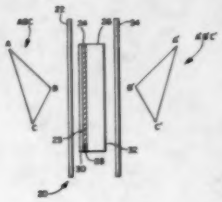
Filed May 22, 1981, Ser. No. 267,178
Int. Cl.³ G01T *1/20*
U.S. Cl. 250—363 R **19 Claims**

1. An instrument for viewing x-ray and gamma-ray emitting objects, comprising:

means (22) for forming incident x-rays and gamma-rays emitted by an object into an array of mini-images of said object;

means (24) spatially displaced from said forming means (22) for converting said x-ray and gamma-ray mini-images into visible-light mini-images;

first means (26) coupled to said converting means (24) for intensifying said visible-light mini-images; and



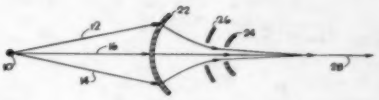
screening means (34/48) having a plurality of apertures, spatially displaced from said first intensifier means (26), for providing a reconstructed autostereoscopic visible-light image of said object having a continuum of perspective views.

4,404,470

NEUTRON STREAK CAMERA

Ching L. Wang, Livermore, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 14, 1981, Ser. No. 263,649
Int. Cl.³ G01T *3/00*
U.S. Cl. 250—390 **7 Claims**



1. A neutron streak camera electrode assembly for receiving neutrons from a point source of neutrons and providing secondary electrons indicative of said neutrons, comprising:

a cathode of neutron-sensitive material which emits slower secondary electrons when struck by neutrons from the point source, said cathode having a curved configuration and positioned along an axis with respect to said point source, the cathode being curved so that differences between the arrival times of neutrons, simultaneously emanating from the point source of neutrons but arriving at different times at the cathode, are compensated for by the transit times of the secondary electrons which are emitted from said curved cathode for each neutron striking the cathode;

an anode having a voltage impressed thereupon for accelerating the secondary electrons emitted by the cathode.

4,404,471

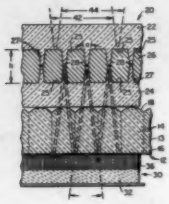
LENTICULAR X-RAY FILM WITH IMPROVED GRATING MASK AND INTENSIFYING SCREEN

Douglas F. Winnek, 10450 W. Loyola Dr., Los Altos Hills, Calif. 94022, and William J. McKee, P.O. Box 21247, San Jose, Calif. 95151

Filed Jan. 11, 1980, Ser. No. 111,152
Int. Cl.³ G03B *11/00, 35/00*; G21K *1/02*
U.S. Cl. 250—482.1 **4 Claims**

1. In combination, a lenticular film having a pair of opposed faces, a photographic emulsion on one face thereof, and a number of lenticulations on the opposite face thereof; an intensifying screen having a substrate provided with a pair of opposed, flat faces, one face of the substrate having a plurality of spaced phosphor segments extending thereinto, the substrate being transparent to x-rays and opaque to visible light, the

phosphor segments having end faces adjacent to the emulsion on the film and a grating mask for limiting the passage of x-ray beams directed toward the film, the mask being adjacent to the lenticulations of the film and having a body provided with a plurality of elongated, generally perallel grooves therewithin, each groove being filled with a material opaque to x-rays, the



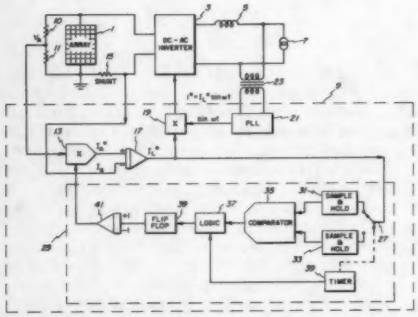
longitudinal axes of the grooves being generally parallel with each other, each pair of adjacent grooves having a gap therebetween to permit passage of x-ray beams through the mask, the width of each groove being greater at the center of the groove than at the ends thereof to permit the sides of each groove to converge toward each other as the ends are approached.

4,404,472

MAXIMUM POWER CONTROL FOR A SOLAR ARRAY CONNECTED TO A LOAD

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,845
Int. Cl.³ H02J *3/38*
U.S. Cl. 307—46 **6 Claims**



1. A control for providing maximum power from a solar array for varying levels of insolation and temperature, said solar array interfaced to a load by a power converter, said control comprising:

means for providing a signal proportional to the array voltage;

means for providing a signal proportional to the array current;

variable gain means receiving said array voltage signal and providing a commanded array current proportional to the array voltage;

means for supplying a command to said power converter to draw commanded array current from said solar array;

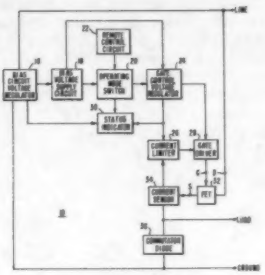
means for varying the gain of said variable gain means to draw maximum power from said array, said means including means for repeatedly sensing whether the power supplied by the power converter to the load is increasing or decreasing, and means for changing the gain of said variable gain means in one direction as long as the power to the load is sensed to be increasing and changing the gain of said variable gain means in an opposite direction whenever the power supplied to the load is sensed to be decreasing.

4,404,473

DIRECT CURRENT POWER CONTROLLER

David A. Fox, Shawnee Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 17, 1981, Ser. No. 331,863
Int. Cl.³ H02H *9/02*
U.S. Cl. 307—125 **16 Claims**



9. A direct current control system comprising:

a direct current load;

a source of direct current;

a ground conductor connected to said load and said source of direct current;

a direct current power controller comprising a power field effect transistor (FET) with source, drain and gate terminals wherein said drain is connected to said source of direct current;

current sensing means connected between said FET source terminal and a load terminal which is connected to said direct current load;

a ground terminal connected to said ground conductor;

means for establishing a bias voltage which is greater than a line voltage supplied by said source of direct current to said FET drain terminal, where said line voltage and said bias voltage are both measured with reference to said ground terminal;

means for turning on said FET by applying a voltage to said gate terminal, wherein said means for turning on said FET is referenced to a common bus which is connected to said load terminal; and

current limiting means responsive to a voltage across said current sensing means for turning off said FET by removing voltage from said gate terminal, wherein said current limiting means is referenced to said common bus.

4,404,474

ACTIVE LOAD PULSE GENERATING CIRCUIT

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

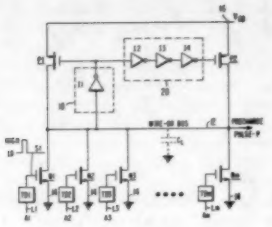
Filed Feb. 6, 1981, Ser. No. 232,359
Int. Cl.³ H03K *19/08, 19/34, 5/153*
U.S. Cl. 307—260 **19 Claims**

1. In combination with an input signal responsive transistor having its conduction path connected between an output line and a first point of operating potential, said signal responsive transistor, when turned-on, tending to clamp said output line to said first point of potential, means for generating a well defined pulse on said output line having relatively sharp leading and trailing edges in response to the turn-on of said signal responsive transistor, comprising:

a controllable impedance load means connected between said output line and a second point of operating potential; and

means responsive to the voltage on said output line coupled to said load means for:

(a) maintaining the impedance of said load means relatively high when said signal responsive transistor is OFF;



(b) switching the impedance of said load means to a very high value and substantially interrupting conduction therethrough for a given predetermined period of time when said signal responsive transistor is turned-on; and

(c) switching the impedance of said load means to a very low value and enabling substantial conduction therethrough for a given time following said given predetermined period of time.

4,404,475

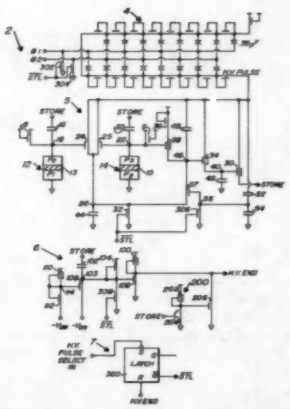
INTEGRATED CIRCUIT HIGH VOLTAGE PULSE GENERATOR SYSTEM

Joseph Drori, San Jose; William H. Owen, III, Mountain View, and Richard T. Simko, Los Altos, all of Calif., assignors to Xicor, Inc., Milpitas, Calif.

Filed Apr. 8, 1981, Ser. No. 252,231

Int. Cl.³ H03K *3/45, 3/01;* **H03L** *5/00*

U.S. Cl. 307—264 **16 Claims**



1. An integrated circuit device comprising:

means responsive to a first voltage pulse of increasing magnitude for generating a store signal of substantially equal amplitude;

means for capacitively coupling said store signal across a dielectric gap between a first region and a second region;

means for sensing when said store signal has reached a minimum voltage level so as to cause electron tunneling to begin across said dielectric gap from said first region to said second region;

means responsive to said sensing means for generating a reference voltage whose voltage amplitude reflects said minimum voltage level and;

means responsive to the generation of said reference voltage for limiting said store signal to a predetermined voltage amplitude with respect to said reference voltage amplitude.

4,404,476

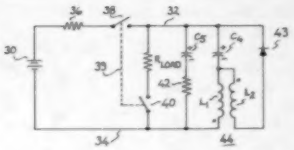
PULSE SHAPING AND AMPLIFYING CIRCUIT

Georges R. E. Lezan, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Sep. 24, 1981, Ser. No. 305,091

Int. Cl.³ H03K *5/01, 5/07, 5/12*

U.S. Cl. 307—268 **12 Claims**



1. A pulse shaping and amplifying circuit, adapted to be connected to a source of direct current power, for selectively supplying a pulse of electrical power to a load comprising:

(a) an oscillatory circuit including first inductive means and a charge storage means;

(b) first switch means operable to connect the source to said charge storage means to thereby develop an electrical charge on said charge storage means in a first direction;

(c) second switch means operable to connect said charge storage means in series circuit with the load whereby electrical power is delivered from said charge storage means to the load and said charge storage means is charged in a second direction; and,

(d) a flyback path including a second inductive means closely magnetically coupled with said first inductive means, said flyback path connected in effective parallel with said charge storage means whereby electrical energy not dissipated in said load and said oscillatory circuit is utilized to charge said charge storage means in the first direction.

4,404,477

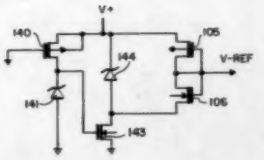
DETECTION CIRCUIT AND STRUCTURE THEREFOR

Robert L. Chao, Sunnyvale, Calif., assignor to Supertex, Inc., Sunnyvale, Calif.

Division of Ser. No. 880,035, Feb. 22, 1978, Pat. No. 4,215,281. This application Nov. 13, 1979, Ser. No. 93,157

Int. Cl.³ H03K *3/01;* **G05F** *3/20*

U.S. Cl. 307—297 **3 Claims**



1. A reference voltage circuit, comprising, in combination;

first and second voltage supply terminals;

a first zener diode and a first field effect transistor serially coupled, in the order recited, between said first and second voltage supply terminals;

a second field effect transistor and a second zener diode serially coupled, in the order recited, between said first and second voltage supply terminals, said second transistor being complementary to said first transistor and having a control electrode;

said control electrode being coupled to said first zener diode and said first transistor; and

output means comprising third and fourth serially connected field effect transistors coupled to said second transistor and across said second zener diode for providing said reference voltage at a point between said third and fourth transistors.

4,404,478

PROCESS FOR CONTROLLING A DARLINGTON CIRCUIT AND A LOW-LOSS DARLINGTON CIRCUIT

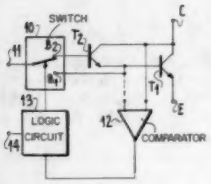
Klaus Rischmüller, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 18, 1980, Ser. No. 208,062

Claims priority, application France, Nov. 23, 1979, 79 28979

Int. Cl.³ H03K *3/26, 17/60, 23/22*

U.S. Cl. 307—315 **4 Claims**



1. A process for controlling a Darlington circuit comprising a power transistor and a pilot transistor, comprising the following steps:

detecting the collector current in the power transistor,

comparing the detected value with a predetermined threshold value, and

causing the power transistor to operate independently of the pilot transistor when the collector current is less than a predetermined threshold.

4,404,479

SAMPLE-AND-HOLD CIRCUIT

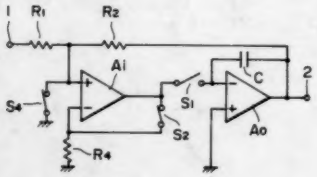
Kazuya Toyomaki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Mar. 26, 1981, Ser. No. 247,973

Claims priority, application Japan, Mar. 27, 1980, 55-39215

Int. Cl.³ G11C *27/02*

U.S. Cl. 307—353 **6 Claims**



1. A sample-and-hold circuit comprising:

(a) a first voltage amplifier having a noninverting input terminal connected via a first resistor to an input terminal of said sample-and-hold circuit, an inverting input terminal connected via a second resistor to ground, and an output terminal;

(b) a second voltage amplifier having an inverting input terminal connected via a first switch to said output terminal of said first voltage amplifier, a noninverting input terminal connected to ground, and an output terminal connected to an output terminal of said sample-and-hold circuit;

(c) a hold capacitor interposed between said inverting input terminal and said output terminal of said second voltage amplifier;

(d) a third resistor interposed between said noninverting input terminal of said first voltage amplifier and said output terminal of said second voltage amplifier;

(e) a second switch interposed between said inverting input terminal and said output terminal of said first voltage amplifier, and arranged to perform on-off operations in opposite manner with respect to said first switch; and

(f) a third switch interposed between said noninverting input terminal of said first voltage amplifier and ground, and arranged to perform on-off operations in opposite manner with respect to said first switch.

4,404,480

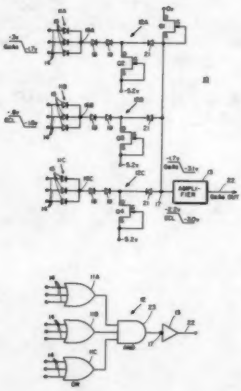
HIGH SPEED-LOW POWER GALLIUM ARSENIDE BASIC LOGIC CIRCUIT

Stephen A. Ransom, Huntingdon Valley, and Tedd K. Stickel, Chalfont, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 1, 1982, Ser. No. 344,585

Int. Cl.³ H03K *19/094, 19/017, 19/20*

U.S. Cl. 307—475 **10 Claims**



1. A high speed gallium arsenide basic logic circuit for processing either emitter coupled logic (ECL) or gallium arsenide (GaAs) signals comprising:

a plurality of OR gates each having a plurality of individual input lines with at least one forward biased diode connected in series with each input line,

each said OR gate having an output node connected to said input lines at the cathode side of said diodes,

said OR gates providing a voltage shift down across said diodes of said input lines,

a plurality of level shifting networks, each being connected in series with one of said OR gates,

each said level shifting network comprising at least three diodes of which at least two of said diodes are forward biased to provide a further voltage shift down,

said plurality of level shifting networks comprising a diode AND gate,

each said level shifting network having at least one diode which is connected in series to cause a level shift up,

each diode of said AND gate being forward biased by a pull-up transistor connected to the anode side and a pull-down transistor connected to the cathode side, and

an amplifier stage connected to the output of said level shifting network, whereby voltage signal levels applied to the input of said OR gates are processed through logic decisions while being shifted down and shifted up before being amplified, thus, providing enhanced speed power products in simplified GaAs logic circuitry.

4,404,481

CAPACITANCE TO VOLTAGE CONVERSION APPARATUS

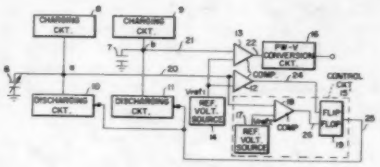
Toshimine Ide; Takeshi Shimamoto, both of Hirakata, and Yoshiaki Igarashi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 19, 1981, Ser. No. 312,846

Claims priority, application Japan, Oct. 20, 1980, 55-147201; Nov. 21, 1980, 55-164980

Int. Cl.³ G06G *7/10*; H03K *3/017*

U.S. Cl. 307—491 **3 Claims**



1. A C-V conversion apparatus comprising:

a capacitive sensor whose capacitance is changed corresponding to a change of a physical parameter;

a reference capacitor;

a first charging circuit for charging said capacitive sensor;

a second charging circuit for charging said reference capacitor;

a first discharging circuit for discharging said capacitive sensor;

a second discharging circuit for discharging said reference capacitor;

a charging/discharging control means for controlling a charging and discharging cycle of said capacitive sensor and said reference capacitor;

a reference voltage source for generating a reference voltage;

a first comparator for comparing a voltage of said capacitive sensor with said reference voltage and for generating a control signal to control said charging/discharging control means;

a second comparator for comparing a voltage of said reference capacitor with said reference voltage and for generating a pulse signal whose mean value is proportional to a capacitance of said capacitive sensor; and

a pulse width-voltage conversion circuit for convertng said pulse signal to a d.c. voltage signal, said pulse width-voltage conversion circuit having a characteristic for compensating for a non-linear conversion characteristic of said capacitive sensor by selecting a charging time constant and a discharging time constant of said pulse width-voltage conversion circuit so that said d.c. voltage signal is proportional to said physical parameter.

4,404,482

ELECTRODES FOR MAGNETOHYDRODYNAMIC POWER GENERATION

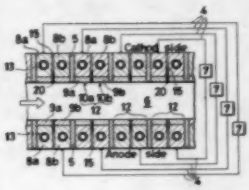
Takayasu Okuo, and Kiyonami Takano, both of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Feb. 25, 1982, Ser. No. 352,464

Claims priority, application Japan, Mar. 2, 1981, 56-29700

Int. Cl.³ H02K *44/10*

U.S. Cl. 310—11 **3 Claims**



1. An electrode constituting a generating channel in the MHD generator and having an anode side and a cathode side, which comprises:

a plurality of unit electrodes arranged along the direction of the flow of a combustion gas plasma, each of said plurality of unit electrodes being divided into a plurality of electrode elements;

a plurality of resistors each said resistor for connecting the respective adjacent electrode elements of said plurality of electrode elements to one another;

leading-out means disposed on the electrode element on the anode side falling on the most downstream side of said plurality of electrode elements relative to the flow of plasma; and

leading-out means disposed on the electrode element on the cathode side falling on the most upstream side of said plurality of electrode elements.

4,404,483

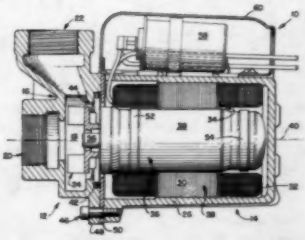
METHOD OF FABRICATING A WET-ROTOR CIRCULATOR AND CIRCULATOR PRODUCED THEREBY

Benno Lebkuchner, Warwick, R.I., assignor to Taco, Inc., Cranston, R.I.

Filed Feb. 26, 1981, Ser. No. 238,459

Int. Cl.¹ H02K *15/00*

U.S. Cl. 310—42 **12 Claims**



1. A wet rotor assembly for a wet rotor pump, said assembly comprising:

a rotor having a core secured to a shaft for rotation therewith about an axis;

bearings journalled to said shaft to permit rotation of said rotor about said axis;

a fluid impermeable jacket with an open end and a closed

end fabricated from a material of low magnetic permeability, said rotor and bearings located within said jacket with said bearings supported against an inside diameter surface of said jacket;

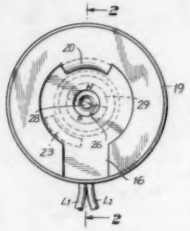
circumferential rings mounted about the outer diameter surface of said jacket in axial registration with said bearings within said jacket, said circumferential rings having been driven uniformly circumferentially inward by application of an applied magnetic field to circumferentially clamp said bearings in place in said jacket, said jacket having a surface structure at a location of said bearings which is structurally defined during the magnetic field application to said circumferential rings to secure the jacket to said bearings.

4,404,484

ELECTRIC ROTATING MACHINE

George L. Gillott, Prospect, Conn., assignor to Tri-tech, Inc., Waterbury, Conn.

Filed Mar. 6, 1981, Ser. No. 241,362
Int. Cl.³ H02K *37/00*
U.S. Cl. 310—49 R **12 Claims**



1. An electric rotating machine comprising a rotor assembly including a rotor shaft and a permanent magnet rotor magnetized to have at least one pair of magnetic poles of mutually opposite polarity arranged circumferentially about said shaft and being separated by an electrical angle of $n\pi$ where n is an odd integer; and a stator assembly generally surrounding said rotor and including a helical stator coil generally surrounding and coaxial with said rotor and through which electric current is to flow, a case surrounding said coil and having first and second ends corresponding to opposite ends of the shaft, first and second pole pieces of substantially the same size extending from respective ends of the case into the interior thereof between said coil and said rotor and disposed circumferentially at an electrical angle different from $n\pi$; and first and second biasing magnets arranged at the respective ends of said case so that the first and second pole pieces are given respective north and south quiescent polarizations.

4,404,485

DIRECT CURRENT MOTOR

Itsuki Ban, 829, Higashi-Oizumimach, Nerima-ku, Tokyo; Manabu Shiraki, 4451-171 Shimotsuruma, Yamato-shi, Kanagawa-ken, and Kazuhito Egami, 2-44-1 Chuo, Nakano-ku, Tokyo, all of Japan

Filed Jun. 15, 1981, Ser. No. 273,328
Int. Cl.³ H02K *13/14*
U.S. Cl. 310—198 **1 Claim**

1. A direct current motor comprising:

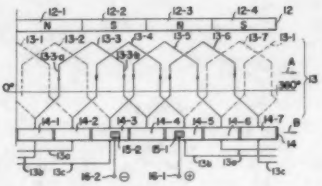
a field magnet provided with 2n magnetic poles which are magnetized with the same angular intervals as those of the magnetic poles N and S, where n is an integer of 1 or more;

a magnetic member for closing the magnetic circuit of said magnetic poles of said field magnet;

a plurality of armature coils disposed in such a manner that the angular intervals of the electrically conductive portions thereof, contributing to the generation of torque in said armature coils, are substantially equal to the magnetic pole width of said field magnet;

electric power supply control means to which the terminals of said armature coils are connected;

short-circuit means for short-circuiting the winding intiation terminals of predetermined armature coils directly to other of said terminals, in which at least one terminal is not shorted to any other, and the winding end terminals of other predetermined armature coils through said electric power supply control means;



an armature comprising armature coils in a first series and armature coils in a second series, through which said short-circuit means and said plurality of armature coils are connected in parallel to the positive pole and negative pole of a DC power source, said armature positioned so as to face said field magnet; and

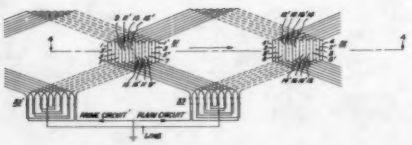
a rotating shaft for rotatably supporting said armature or said field magnet as a rotor, said rotating shaft rotatably supported by bearings disposed on an outer casing of said direct current motor.

4,404,486

STAR CONNECTED AIR GAP POLYPHASE ARMATURE HAVING LIMITED VOLTAGE GRADIENTS AT PHASE BOUNDARIES

Thomas A. Keim, Clifton Park, and Stephen H. Minnich, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1980, Ser. No. 220,203
Int. Cl.³ H02K *19/00*
U.S. Cl. 310—198 **20 Claims**



1. A star-connected air gap polyphase armature winding for a dynamoelectric machine comprising:

a plurality of wound coils electrically interconnected into a plurality of different phase groups to form polyphase windings of an armature;

each of said plurality of coils being wound with the windings at each circumferentially-outer edge of the respective phase belt being at a low electrical potential relative to the windings at the circumferential center of the same phase belt;

one lead from each circuit of each phase at one circumferentially-outer edge of a respective phase belt being connected in common to form a neutral terminal; and

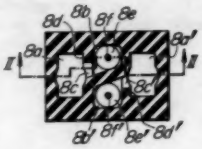
one lead from each circuit of each phase at approximately the circumferential center of a respective phase belt being connected in common to form a line terminal for that phase.

4,404,487

BRUSH HOLDING DEVICE FOR ALTERNATORS

Takayasu Nimura, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 2, 1981, Ser. No. 326,655
Claims priority, application Japan, Dec. 26, 1980, 55-185262
Int. Cl.³ H02K 13/00
U.S. Cl. 310—239 9 Claims



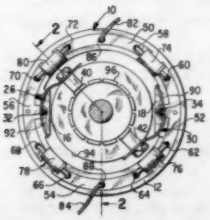
1. A brush holding device for holding brushes in sliding contact with slip rings of an alternator, comprising:
- a brush holder formed in one body from an electrically insulating material to include a pair of brush chambers open at one of their ends to face said slip rings;
- a pair of brushes movably received in said brush chambers respectively;
- coiled springs disposed in said chambers respectively for urging one end of said brushes into resilient sliding contact with said slip rings;
- a pair of terminal plates fixed to said brush holder; and
- pig tails electrically connecting said brushes and said terminal plates respectively,
- said brush holder having a pair of pig tail chambers respectively adjacent said brush chambers and further having a pair of walls separating said pig tail chambers from said brush chambers respectively,
- said terminal plates being in said pig tail chambers respectively,
- there being a slit in each of said separating walls adjacent the other end of the respective brush,
- said pig tails being accomodated by said pig tail chambers and extending from said terminal plates through said slits respectively into adjacent brush chambers and being connected to respective sides of said brushes.

4,404,488

BRUSH BOARD ASSEMBLY FOR DYNAMOELECTRIC MACHINE

John A. Herr, Garwood, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 12, 1982, Ser. No. 338,932
Int. Cl.³ H02K 13/00
U.S. Cl. 310—239 3 Claims



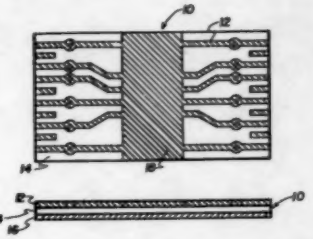
1. A brush board asssembly for a dynamoelectric machine comprising a non-conductive mounting board formed as a ring to extend around a commutator and including inwardly projecting portions, printed circuitry on the ring with portions extending onto the projecting portions of the ring where holes pass through the printed circuitry and ring, electrically conductive flat-type springs with slots through which said projecting portions of the ring and printed circuitry extend, electrically conductive pins in said holes and in tight engagement with the springs for securing the springs to the ring and electrically connecting said printed circuitry with the springs, and a commutator engageable brush affixed on each spring.

4,404,489

ACOUSTIC TRANSDUCER WITH FLEXIBLE CIRCUIT BOARD TERMINALS

John D. Larson, III, Palo Alto, Calif., and David G. Miller, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1980, Ser. No. 203,409
Int. Cl.³ H01L 41/22
U.S. Cl. 310—334 3 Claims



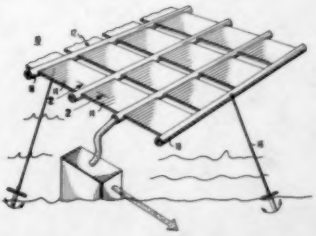
1. An apparatus for an acoustic transducer comprising:
- a flexible circuit board having a first layer of a plurality of conductive traces and a second layer of insulation;
- a piezoelectric block having a plurality of piezoelectric elements attached to a part of said circuit board first layer; and
- attachment means for directly attaching each of said plurality of piezoelectric elements to one of said plurality of conductive traces to form a plurality of individual transducer elements.

4,404,490

POWER GENERATION FROM WAVES NEAR THE SURFACE OF BODIES OF WATER

George W. Taylor, 305 Dodds La., Princeton, N.J. 08540, and Joseph R. Burns, 3 Queens La., Pennington, N.J. 08534

Filed Jul. 21, 1980, Ser. No. 170,858
Int. Cl.³ F03B 13/12
U.S. Cl. 310—339 23 Claims



1. The use of a piezoelectric material member for converting the mechanical energy of the surface waves of a body of water to electrical energy, said use comprising disposing said member beneath the surface of the body of water for directly absorbing pressure variations caused by the surface waves, said

member including electrodes thereon between which an alternating voltage is generated in response to said pressure variations, the area of each of said electrodes being in excess of one square meter, means for preventing shorting of the electrodes by the surrounding water, and collecting, by means responsive to the alternating voltage at a frequency of said waves, the power generated by said member.

4,404,491

ELECTRIC INCANDESCENT LAMP

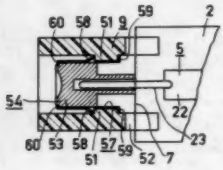
Gustaaf F. R. Sioens, and Johannes M. A. Van der Heijden, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,713

Claims priority, application Netherlands, Nov. 9, 1979, 7908214

Int. Cl.³ H01J *5/50*

U.S. Cl. 313—318 **3 Claims**



1. An electric incandescent lamp having a tubular glass lamp envelope which is sealed in a vacuum-tight manner at each end by means of a pinch and in which an incandescent filament is accommodated between current supply conductors each of which extends through a respective pinch and emanates at the end face of the pinch extending transversely to the axis of the lamp envelope, each supply conductor being connected outside the pinch to a respective cylindrical contact cap which is mounted in an insulator sleeve, characterized in that the insulator sleeve is coupled to the contact cap, by means of a metal spring and further, characterized in that the insulator sleeve has an abutment on its inner surface and that the metal spring is in the form of a sleeve and has projecting lugs which together enclose the abutment in the insulator sleeve and has inwardly directed lugs which fix the spring relative to the contact cap.

4,404,492

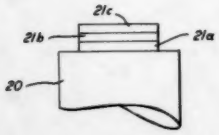
CATHODE STRUCTURE FOR CATHODE RAY TUBES AND METHOD FOR PRODUCING SAME

George Palty, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,878

Int. Cl.³ H01J *1/02*

U.S. Cl. 313—355 **14 Claims**



1. A cathode structure for cathode ray tubes comprising:
(a) a supporting substrate of a nickel alloy; and
(b) a multilayer structure adherent to the substrate, at least the innermost layer in contact with the substrate comprising Ni-containing material, and at least the outermost layer comprising electron emissive material, characterized in that the multilayer structure is formed from a laminate of at least two self-supporting layers, each layer comprised of particles of inorganic material dispersed in a fugitive organic binder matrix.

4,404,493

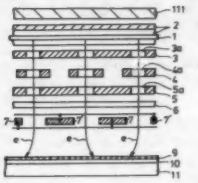
PICTURE IMAGE DISPLAY APPARATUS

Kinzo Nonomura, Hirakata; Masanori Watanabe, Katano; Yoshinobu Takesako, Neyagawa; Hiroyuki Irie, Osaka, and Susumu Ide, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 3, 1981, Ser. No. 250,713

Int. Cl.³ H01J *29/70*

U.S. Cl. 313—422 **4 Claims**



1. A picture image display apparatus comprising:
a flat type vacuum enclosure having a transparent face panel,
an electron beam emitter which emits a predetermined number of electron beams disposed in a row in selected positions,
a row of control electrodes to control intensities of said electron beams,
a row of parallel deflection electrodes, every other one of them being first electrodes commonly connected to each other, the other ones of them being second electrodes commonly connected to each other,
a phosphor screen formed on the inner face of said face panel, and
an anode of thin metal film formed on the surface of said phosphor screen,
wherein the apparatus is characterized in that
every one of said first electrodes and a neighboring one of said second electrodes form a deflection gap, neighboring one of said gaps have electric fields of opposite directions relative to each other, and said gaps are disposed in a manner such that said electron beams simultaneously pass through every said deflection gap.

4,404,494

TRAVELLING WAVE TUBE WITH PERIODIC-PERMANENT MAGNET FOCUSING SYSTEM

Hinrich Heynisch, Gräfelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,566

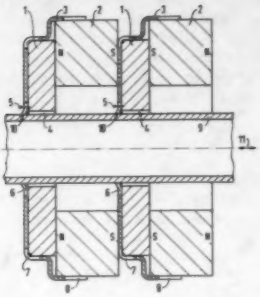
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015231

Int. Cl.³ H01J *25/34*

U.S. Cl. 315—3.5 **6 Claims**

1. Travelling wave tube, comprising a cylindrical vacuum shell having an outer diameter, a permanent magnet system surrounding said cylindrical vacuum shell including ring-shaped pole shoes having inner and outer diameters, magnet rings having inner and outer diameters and forming pairs with said pole shoes, each of said magnet rings being alternatingly disposed between two pole shoes in axial direction and being poled in opposite sense with respect to the next magnet ring, said inner diameters of said pole shoes being closely fitted around said vacuum shell and being smaller than said inner diameters of said magnet rings, said outer diameters of said

magnet rings being larger than said outer diameters of said pole shoes, and a respective centering and retaining ring being disposed between and in contact with each of said pole shoe and magnet ring pairs for centralizing said inner diameters of



said pole shoes to said outer diameters of said magnet rings and for centralizing said inner diameters of said pole shoes and said outer diameters of said magnet rings to said outer diameter of said vacuum shell.

4,404,495

HIGH FREQUENCY RESONATOR

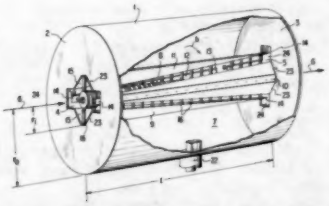
Rolf W. Müller, Dreieich, Fed. Rep. of Germany, assignor to Gesellschaft für Schwerionenforschung mbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 30, 1981, Ser. No. 230,273

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003258

Int. Cl.³ H01J *25/10*

U.S. Cl. 315—5.41 **10 Claims**



1. In a high frequency resonator for accelerating a beam of heavy ions in an accelerator, which resonator includes a cylindrical resonator housing having a beam inlet end via which the beam enters the housing, a beam outlet end via which the beam leaves the housing and a longitudinal axis defining a path for travel of the beam between the ends, means defining first and second opposed end walls each at a respective end of the housing, and an even number of elongate, conductive current collectors disposed within the housing, extending longitudinally thereof, and spaced apart equidistantly about the beam axis, with every other collector being connected to said first end wall and the intervening collectors being connected to said second end wall, the number of such collectors being at least four, the improvement wherein:

each said end wall is provided with a central opening surrounding the longitudinal axis of said housing;

each said current collector extends the full length of said housing;

each said collector has two longitudinal ends, one longitudinal end of each collector extends into said opening of that end wall to which that said collector is connected and the other longitudinal end of each collector extends into said opening of the other said end wall while being out of contact with the other said end wall; and

each said collector has a width in a direction transverse to its longitudinal extent, and the width of each collector decreases, along its longitudinal extent, from a maximum width at its said one longitudinal end to a minimum width at its said other longitudinal end in a manner to establish an at least approximately uniform current density on the surface of each said collector.

4,404,496

LIGHT SOURCE APPARATUS USING FLASH DISCHARGE TUBE

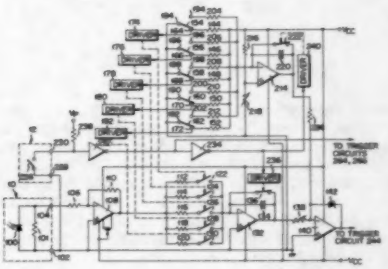
Seiichi Hosoda, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,565

Claims priority, application Japan, Mar. 24, 1980, 55-37174

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—151 **3 Claims**



1. A light source apparatus using a flash discharge tube operable to illuminate a foreground subject for photographing said foreground subject on a film of given sensitivity, comprising:

a power source;

a flash discharge tube and a switching element connected in series combination with said flash discharge tube, said series combination being connected across said power source;

light receiving means for receiving and photoelectrically converting light reflected by said foreground subject and integrating the received reflected light as a function of the sensitivity of the film being used to produce a signal corresponding to the incident light does;

compensation means for producing a compensation signal in accordance with a preset film sensitivity; and

decision means coupled to said compensation means and to said light receiving means for comparing the output signal of said compensation means with the output signal of said light receiving means, and for producing an interruption signal for rendering said switching element nonconductive when the difference between said two output signals reach a predetermined value.

4,404,497

POWER SUPPLYING APPARATUS

Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Corporation, Tokyo, Japan

Filed Apr. 16, 1980, Ser. No. 140,879

Claims priority, application Japan, Apr. 21, 1979, 54/049600

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **12 Claims**

1. A power supplying apparatus, comprising:

a direct current power source for providing a direct current voltage;

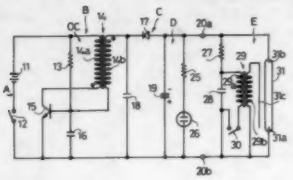
voltage converting means for converting said direct current voltage from said direct current power source into an alternating current voltage;

rectifying means for rectifying said alternating current voltage provided by said voltage converting means to provide a direct current voltage;

a load circuit; and

means for supplying said direct current voltage provided by said rectifying means to said load circuit;

said voltage converting means comprising an oscillating transformer having a primary winding connected to said direct current power source for receiving a flow of current, and a secondary winding electromagnetically coupled to said primary winding, an oscillator circuit connected to said oscillating transformer and including switch



means for controlling the current flowing in said primary winding of the oscillating transformer, and biassing means for controlling said switch means of the oscillator circuit;

wherein said switch means comprises a transistor having a collector-emitter circuit connected to said direct current power source via said primary winding, said transistor also having a base electrode, said biassing means comprising a resistor directly connecting said base electrode to a first terminal of said direct current power source, said resistor being directed connected to said base electrode to form a junction therebetween, said junction being directly connected to a first terminal of said secondary winding;

said apparatus further comprising a stabilizing capacitor connected between a second terminal of said secondary winding and a second terminal of said direct current power source.

4,404,498

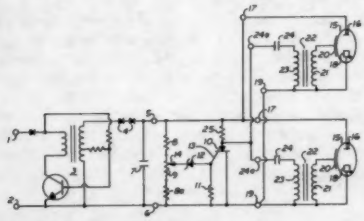
MULTIPLEX STROBE LIGHT

Joseph Spiteri, P.O. Box 158, Harborcreek, Pa. 16421

Filed Mar. 5, 1981, Ser. No. 240,798

Int. Cl.³ H05B *41/34*

U.S. Cl. 315—241 R **7 Claims**



1. Apparatus for the simultaneous energization of a plurality of gas discharge lamps each having an anode, a cathode and a control electrode, said apparatus comprising: capacitive discharge means for storing electric energy and releasing the stored electric energy to the anodes and cathodes of the lamps, trigger capacitor means for storing electric energy and releasing the stored electric energy to the control electrodes and cathodes of the lamps, each lamp having a transformer with a secondary winding connected across its control electrode and its cathode and a primary winding connected across said trigger capacitor means, circuit means for providing electric energy to said capacitive discharge means and to said trigger capacitor means, circuit means for connecting the primary windings in parallel with each other and in series with the trigger capacitor means and for connecting each secondary winding individually to its control electrode, and switch means for discharging the trigger capacitor means through said primary windings, the polarity of the windings being such that the initial voltage induced in the secondary windings is negative at said control electrodes.

4,404,499

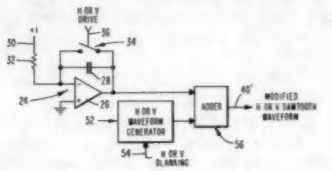
CIRCUIT FOR MINIMIZING EDGE HOOKING IN TELEVISION CAMERA PICKUP TUBES

John O. Ryan, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 30, 1981, Ser. No. 248,919

Int. Cl.³ H01J *29/56*

U.S. Cl. 315—371 **11 Claims**



1. A circuit for minimizing edge hooking in a photoelectric tube having a scanning electron beam and a scanned active picture area within a non-scanned tube target area, wherein the scanning electron beam describes a horizontal and vertical scan raster across the active picture area in response to means for generating horizontal and vertical sawtooth waveforms, comprising the combination of;

overscan voltage means integral with the means for generating sawtooth waveforms for selectively increasing the velocity of the electron beam scan only during the horizontal and vertical blanking intervals.

4,404,500

PROJECTION TELEVISION APPARATUS

Richard G. Stow, West Wickham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,667

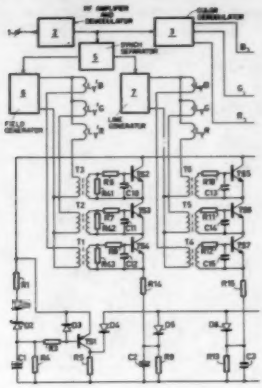
Claims priority, application United Kingdom, Jun. 10, 1980, 8018880

Int. Cl.³ H01J *29/52*

U.S. Cl. 315—386 **4 Claims**

1. Projection television apparatus having a plurality of projection television tubes each adapted to produce a display of a different colour for projection, each projection tube having a line deflection coil and a field deflection coil for deflecting an electron beam when generated in each projection tube in two orthogonal directions, the said line deflection coils being connected in parallel branches connected to a line output stage for providing line deflection current through said line deflection coils, the said field deflection coils being connected to a field output stage for providing field deflection current through said field deflection coils, and protection means for protecting a projection tube in the event of the cessation of or substantial reduction in the line deflection current through the line deflection coil corresponding to said projection tube, said projection means comprises sensing means connected in series with each line deflection coil for separately sensing the line deflection

current therethrough, and means responsive to said sensing means for preventing the electron beams from falling on the



screens of the projection tubes upon the occurrence of the said event.

4,404,501

APPARATUS FOR AUTOMATICALLY SWITCHING OFF AND DISCONNECTING AN ELECTRIC MOTOR SHAFT DRIVE ACCELERATING A WINDING BOBBIN ONCE A CIRCUMFERENTIAL CYLINDER DRIVE HAS BECOME EFFECTIVE

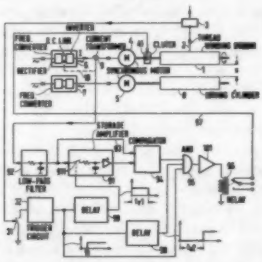
Dietrich Krampe, Neunkirchen, and Tilo Heyl, Stuttgart, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,355

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111990

Int. Cl.³ B65H *54/02*

U.S. Cl. 318—7 **10 Claims**



1. In a textile winding bobbin driving system which includes a first electric motor turning a shaft drive connected to a winding bobbin, a second electric motor driving a circumferential cylinder drive which engages said winding bobbin after textile has been wound thereon to a certain thickness and which is synchronized with the circumferential velocity of said bobbin, means for accepting a signal to switch-off the first motor and disconnect said shaft drive and means for producing a signal corresponding to the start of the winding of textile on said bobbin, an apparatus for automatically producing the signal to switch-off said first motor and disconnect said shaft drive after said circumferential drive has engaged said bobbin comprising:

(a) means for developing a signal proportional to the torque developed by the first motor;

(b) means for storing a value proportional to the torque developed by said first motor after textile has begun to wind on the bobbin but before the cylinder drive has engaged said bobbin and responsive to the means for producing, having an input coupled to said means for developing; and

(c) means for generating a signal which can be provided as an output to the means for accepting to switch-off said first motor and disconnect said shaft drive if said signal proportional to the torque of said first motor is greater than said stored value by a predetermined incremental value ΔI, having an input coupled to said means for developing and another input coupled to the output of said means for storing.

4,404,502

ENERGY SAVING CIRCUIT ARRANGEMENT FOR A PIEZOELECTRIC POSITIONING ELEMENT

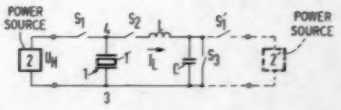
Valentin Magori, and Peter Kleinschmidt, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,481

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048632

Int. Cl.³ H01L *41/08*

U.S. Cl. 318—116 **20 Claims**



14. A circuit arrangement, comprising: a positioning element having first and second piezoelectric bodies to be charged and discharged in reverse phase; a series circuit comprising a controllable switch means and a power source connected in parallel across the first piezoelectric body; a series circuit comprising another controllable switch means, an inductance and the second body being connected in parallel across the first body; and a short circuit switch means connected in parallel with the second body.

4,404,503

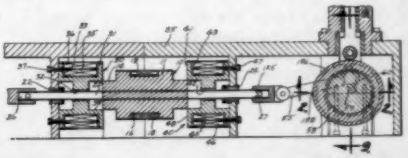
RECIPROCATING ELECTRIC MOTOR

William L. Ward, 2618 Amherst Dr., Wichita Falls, Tex. 76308, and Robert N. Ward, 1717 Midwestern Pkwy., #134, Wichita Falls, Tex. 76302

Filed Nov. 2, 1981, Ser. No. 317,153

Int. Cl.³ H02K *7/06*

U.S. Cl. 318—119 **18 Claims**



1. An electromagnetic motor having a frame and an electrical power source, comprising:

a first field coil having a first piston coil receiving cavity formed therein, secured to said frame and being electrically connectable to said power source;

a second field coil having a second piston coil receiving

cavity formed therein, secured to said frame and being electrically connectable to said power source;

a piston coil having end portions for temporary disposition within said first and second cavities of said first and second field coils during operation, said piston coil being adapted to move within said frame between said first and second field coils and being electrically connected to said power source, said power source generating a constant magnetic polarity in said piston coil; and

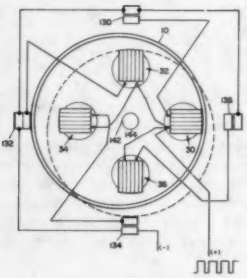
distributor means for selectively supplying electric current to said first and second field coils, said distributor means selectively supplying electric current to said first and second field coils to simultaneously generate opposite magnetic polarities in said field coils whereby said piston coil is simultaneously attracted towards one of said field coils and repulsed away from the other of said field coils, said distributor means including means for periodically reversing the polarity of said field coils.

4,404,504

HIGH-EFFICIENCY, LOW-SPEED ELECTRIC MOTOR SYSTEM

George J. Giel, Los Angeles, Calif., assignor to Leland R. Rowsell, Los Angeles, Calif.

Filed Mar. 19, 1981, Ser. No. 245,372
Int. Cl.³ H02K *29/00*
U.S. Cl. 318—269 **14 Claims**



1. A simple, economical, low speed electric motor system comprising:

a plurality of three or more electromagnets mounted with their pole pieces defining a cylindrical driving circle for said motor;

a substantially rigid hollow cylindrical body of ferromagnetic material having an inner diameter slightly greater than said driving circle defined by said pole pieces;

means for mounting said cylindrical body for rotational movement with its axis parallel to and defining a circle rotating about the axis of said driving circle;

means for sequentially energizing said electromagnets to drive said cylindrical body around said electromagnets with said body successively engaging the pole pieces to roll around said driving circle;

an output shaft substantially aligned with the axis of said driving circle;

means for driving said output shaft from said rigid magnetic cylindrical body as it is actuated by said electromagnets; and

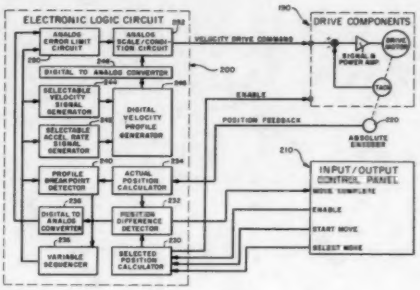
said means for driving said output shaft from said cylindrical body including an inner gear and an outer gear with the inner gear having a lesser diameter and number of teeth than the outer gear.

4,404,505

PROGRAMMABLE MULTIPLE POSITION MACHINE

Douglas L. Swanson, McKean, and Ronald K. Turk, Erie, both of Pa., assignors to Swanson Systems, Inc., Erie, Pa.

Filed Mar. 3, 1981, Ser. No. 240,146
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 **6 Claims**



1. A multiple position programmable movement machine comprising:

work transfer means mounted for incremental movement;

a drive shaft supporting said work transfer means;

drive means coupled to said work transfer means through said drive shaft for driving said work transfer means, said drive means including a servo-controlled drive motor;

encoder means coupled to said work transfer means to determine the actual position of said work transfer means;

control panel including means for selecting a plurality of rotary positions at which the work transfer means can be positioned; and

means for producing a drive velocity command to said drive motor to cause controlled incremental movement of said work transfer means including:

means, responsive to said encoder means and to said position selecting means, for producing a position difference signal indicating the difference between a selected position and the actual position of the work transfer means;

means, responsive to said encoder means, for triggering a variable sequencer to sequence along a profile breakpoint detector, a selectable acceleration rate signal generator, and a selectable velocity signal generator, thereby producing a plurality of paired velocity and acceleration signals;

velocity profile generation means, responsive to said velocity and acceleration signals for producing a velocity profile output;

means, responsive to said variable sequencer and to said position difference signal, for limiting the magnitude of the position difference signal and for producing a resulting modification signal; and

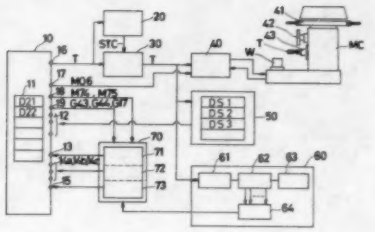
scaling means for receiving said velocity profile output and said modification signal to produce a scaled drive velocity command to said servo-controlled drive motor.

4,404,506

TOOL POSITION OFFSETTING SYSTEM FOR A SPARE TOOL

Hideo Nishimura, Aichi; Kuniyuki Niwa; Yasushi Yamamoto, both of Kariya, and Takao Yoneda, Toyoake, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 14, 1981, Ser. No. 330,667
Claims priority, application Japan, Dec. 16, 1980, 55/178631
Int. Cl.³ G05B 13/00
U.S. Cl. 318—561 6 Claims



1. A tool position offsetting system comprising:

a numerically controlled machine tool having a tool spindle for inserting a tool therein;

a numerical controller connected to said machine tool for controlling machining operations of said machine tool;

a memory provided in said numerical controller for storing tool offset data for said tool;

said numerical controller being capable of offsetting the tool position of said tool in accordance with said tool offset data;

tool life detecting means connected to said numerical controller for detecting the end of the useful tool life of said tool and based thereon to output a first signal;

spare tool changing means connected to said numerical controller and said tool life detecting means for replacing said tool by a spare tool so as to insert said spare tool in said tool spindle in response to said first signal, said spare tool being the same type as the replaced tool;

dimensional data setting means connected between said spare tool changing means and said numerical controller for setting the dimensional data for said spare tool, said dimensional data corresponding to the dimensional difference between said replaced tool and said spare tool;

spare tool detecting means connected to said spare tool changing means for detecting whether a tool inserted in said tool spindle is said spare tool to output a second signal;

input controlling means connected between said spare tool detecting means and said numerical controller for effecting the introduction of the dimensional data for said spare tool to said memory in response to said second signal thereby to amend said tool offset data stored in said memory, whereby said numerical controller controls the machining operations in accordance with said amended tool offset data.

4,404,507

FORMING CONTOURS

Stanley K. Dean, Parkville, and Robert Dow, Oak Park, both of Australia, assignors to Commonwealth of Australia, Canberra, Australia

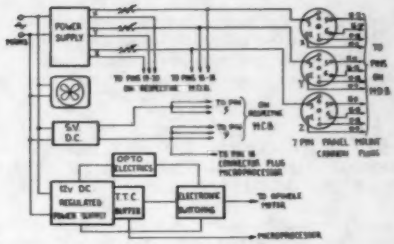
Filed Nov. 24, 1981, Ser. No. 324,671
Claims priority, application Australia, Nov. 25, 1980, PE 6623
Int. Cl.³ G05B 19/24
U.S. Cl. 318—570 6 Claims

1. A method of controlling an apparatus for forming a straight configured contour, or a straight configured segment forming part of a curvilinear contour, and having coordinates in at least two directions, said apparatus incorporating a work piece support, a contour forming means, incremental drives to effect relative movement between said support and said contour forming means in said directions, said method comprising the steps of:

(a) determining the components of said contour or segment in said directions as a number of increments of length equal to a predetermined distance,

(b) for each said direction, producing a count to a predetermined number, the predetermined numbers for said directions being related to each other as the ratio of the inverses of said number of increments for each said direction, and

(c) feeding,



(i) a drive pulse to one of said incremental drives to effect movement in one of said directions over said predetermined distance each time the predetermined number relevant to that direction has been counter, and

(ii) a drive pulse to at least one other of said incremental drives to effect movement in one other of said directions over the same predetermined distance each time the predetermined number relevant to that direction has been counted,

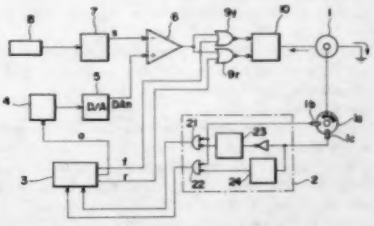
whereby said movements combine to form a relative movement between said support and said contour forming means such as to produce said contour or said segment.

4,404,508

CONTROL METHOD FOR STOPPING DC MOTOR AT PREDETERMINED POSITION

Koji Nishida, and Taneichi Kawai, both of Anjo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 29, 1981, Ser. No. 306,737
Claims priority, application Japan, Oct. 6, 1980, 55-139707
Int. Cl.³ G05B 5/01
U.S. Cl. 318—611 5 Claims



1. A control method for stopping a DC motor at a predetermined position, said DC motor having an output shaft, which method comprises the steps of:

(a) applying a drive voltage to the DC motor to rotate the DC motor in a first direction;

(b) interrupting the drive voltage impressed upon the DC

motor when the output shaft arrives at the predetermined stopping position;

(c) detecting whether the output shaft of the DC motor overshoots the prescribed stopping position;

(d) applying to the DC motor a reverse drive voltage, which has a polarity opposite to that of the interrupted drive voltage as well as a smaller magnitude, when the output shaft overshoots the predetermined stopping position; and

(e) repeating steps (a) through (d) to cause said DC motor to hunt the predetermined stopping position, while successively reducing the magnitude of the applied drive voltage and reverse drive voltage in accordance with the number of times the output shaft overshoots the predetermined stopping position as a result of the hunting operation, whereby the DC motor is stopped at the predetermined stopping position position by successively damping its kinetic energy with each application of the drive and reverse drive voltages of successively smaller amplitude.

4,404,509

DEVICE FOR CONTROLLING THE DRIVE OF A STEPPING MOTOR, TO ADJUST THE LATERAL STITCH BIGHT AND/OR THE FEED LENGTH OF A SEWING MACHINE

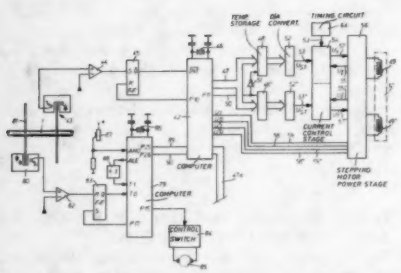
Jürgen Hartwig, Ettlingen, Fed. Rep. of Germany, assignor to Pfaff Hauschaltmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 8, 1980, Ser. No. 184,744

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1979, 2942844

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—685 **3 Claims**



1. A sewing machine comprising:

a main shaft;

a needle bar operatively connected to said main shaft for performing strokes with rotation of said main shaft;

a swing arm engaged with said needle bar for vertically guiding said needle bar and movable to adjust a lateral stitch bight of said needle bar;

a feed dog movable with respect to said needle bar and having a setting member movable to adjust a feed length of said sewing machine;

a first microcomputer;

at least one of a stepping motor connected to said swing arm and a stepping motor connected to said setting member, said at least one stepping motor connected to said first microcomputer and controlled thereby to adjust at least one of the lateral stitch bight and feed length;

a second microcomputer connected to said stepping motor and operable to control variations in a stepping frequency of said stepping motor in proportion to speed variations of the sewing machine main shaft; and

a pulse transmitter connected to said second microprocessor and associated with said main shaft for generating pulses at a rate corresponding to an instantaneous speed of the main shaft.

4,404,510

ELECTRONIC TIMEPIECE

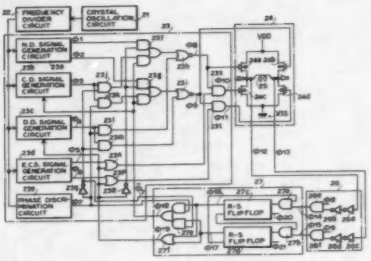
Fumio Nakajima, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1981, Ser. No. 231,861

Claims priority, application Japan, Feb. 6, 1980, 55-12848

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **5 Claims**



1. In an electronic timepiece comprising a step motor composed of an electromagnetic coil excited by a two phase alternating driving signal, a permanent magnet rotor and a stator, the improvement comprising means for changing over said electromagnetic coil from a closed circuit condition to an open circuit condition and vice versa, means for detecting shocks and operative to detect an induced voltage to be generated in the electromagnetic coil when said rotor under its standstill condition is subjected to an external shock, means for discriminating the shock direction and operative to discriminate the shock direction by the difference between the output delivered from said shock detection means and the driving signal, and means for controlling the driving signal on the basis of the output delivered from said shock direction discriminating means.

4,404,511

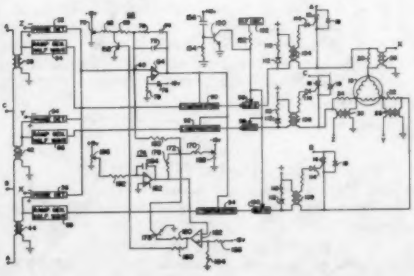
MOTOR POWER FACTOR CONTROLLER WITH A REDUCED VOLTAGE STARTER

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 199,765, Oct. 23, 1980, abandoned. This application Oct. 13, 1981, Ser. No. 310,714

Int. Cl.³ H02P *1/26*

U.S. Cl. 318—729 **8 Claims**



1. A power factor control system for an A.C. induction motor comprising:

current sampling means, including means adapted to be placed in circuit with at least one phase winding of a said

motor, for providing an A.C. output signal representative of the timing of alternating current through said winding;

voltage sampling means adapted to sense the voltage of an electrical input applied to said winding for providing an output signal representative of the timing of alternating current voltage across said winding;

phase detection means responsive to the outputs of said current and said voltage sampling means for providing an output which varies in accordance with the difference in phase between said current and voltage;

signal means for providing a control signal comprising an increasing signal followed by a fixed level signal, the latter comprising a power factor command signal; and

control means adapted to be electrically connected in series with a said winding of a said motor, and responsive to the combined outputs of said phase detection means and signal means for varying the duration of "on" time of each cycle of input power to said winding as an inverse function of the output of said phase detection means and direct function of the output of said signal means;

whereby a gradually increasing power input may be effected to a said motor during a selected starting interval and thereafter the motor be controlled by said fixed power factor command signal.

4,404,512

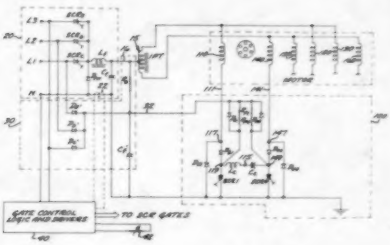
MOTOR DRIVE CIRCUIT

Jack Greenwell, Reno, Nev., assignor to LearAvia, Reno, Nev.

Continuation of Ser. No. 114,081, Jan. 21, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 363,291

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—807 **16 Claims**



1. A parallel-leg inverter circuit for variable frequency, variable voltage operation with a DC voltage supply and electrical loads having at least first and second windings comprising:

first and second current switch means arranged in parallel legs, said first switch means coupled to said first winding and said second switch means coupled to said second winding:

first and second reactance rectifier means coupled to said first and second windings, respectively;

commutating capacitor means coupled to said first and second switch means;

precharge voltage source coupled to said commutating means and adapted to provide a precharge bus voltage at least substantially twice the maximum DC voltage supply;

first and second clamping means, coupled respectively to said first and second current switch means for limiting the voltage applied across said current switch means to approximately the voltage level of said precharge means; and

control means for selective operation of said current switch means.

4,404,513

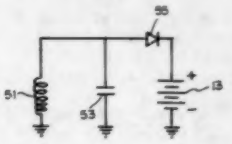
ECONOMICAL FLYWHEEL ALTERNATOR FOR TRICKLE CHARGING A SMALL LAWNMOWER BATTERY

Kenneth W. Campen, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 190,897, Sep. 25, 1980, Pat. No. 4,358,727. This application Jan. 7, 1982, Ser. No. 385,577

Int. Cl.³ H02K *7/02*

U.S. Cl. 322—90 **1 Claim**



1. In an ignition system for an internal combustion engine having a flywheel, a flywheel supported magnetic member comprising a single tangentially poled permanent magnet and a three legged E-shaped stator core with the three leg ends disposed closely adjacent the outer periphery of the flywheel to be magnetically coupled in pairs once furing each revolution of the flywheel by the magnetic member as the magnetic member rotates past the core wherein the three stator core legs are generally coplanar and extend generally parallel to one another with the angle subtended by adjacent "E" legs relative to the flywheel axis being substantially the same as the angular extent of the magnetic member, the improvement comprising a fourth stator core leg having one end closely adjacent the flywheel with the angle subtended by the fourth leg and the adjacent outer leg of the "E" relative to the flywheel axis being substantially the same as the angular extent of the magnetic member, a low voltage coil surrounding the fourth leg, a capacitor connected in parallel with the low voltage coil, storage battery means utilizing electrical energy induced in the low voltage coil by passage of the magnetic member and a rectifier in series with the parallel combination of the low voltage coil and capacitor comprising a diode for conveying a single primary charging pulse to the battery during each revolution of the flywheel to trickle charge the storage battery means.

4,404,514

FAULT DETECTION SYSTEM AS FOR LOCATING FAULTY CONNECTIONS IN A CABLE TELEVISION SYSTEM

Harry J. Reichert, Jr., Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,565

Int. Cl.³ G01R *31/08;* **H04B** *3/46*

U.S. Cl. 324—52 **7 Claims**

1. A method for detecting a faulty connection between the mating surfaces of a connector in a cable television communication system, said method comprising;

transmitting a signal having energy content at respective

first and second frequencies through said communication system;

receiving a signal corresponding to a beat frequency between said first and second transmitted frequencies, said beat frequency signal being generated by heterodyning said first and second frequencies at said faulty connection; and

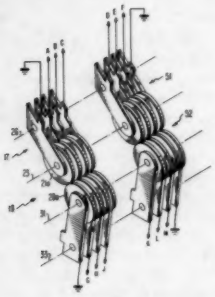
measuring the time interval between the transmission of said signal and the reception of said beat frequency signal.

4,404,515

SYSTEM AND METHOD FOR USE WITH APPARATUS FOR SENSING BARE METAL ON A MOVING STRIP OF INSULATIVELY COATED CONDUCTIVE MATERIAL

Craig E. Deyer, Akron, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1981, Ser. No. 278,451
Int. Cl.³ G01R *31/12*; B65H *25/14*
U.S. Cl. 324—54 **24 Claims**



1. In combination with an apparatus for sensing bare metal on a moving strip of insulated conductive material, said apparatus including a plurality of sensors arranged on both sides of said strip, each of said sensors including a plurality of voltage biased electrical contacts and a grounded electrical contact; a control system for providing a bare metal output signal in response to the selective grounding of said voltage biased electrical contacts comprising:

a plurality of first means individually responsive to said sensors for providing a first signal when at least one of said voltage biased contacts of one sensor is electrically connected to said grounded contact of another of said sensors;

a plurality of second means, each of said second means being responsive to at least two of said first means for providing a second signal in response to the simultaneous reception of two of said first signals; and

third means responsive to said second means for providing said bare metal signal in reponse to the reception of said second signals.

4,404,516

SYSTEM FOR DETECTING LEAKS FROM LIQUID-CONTAINING RESERVOIRS AND CONDUITS

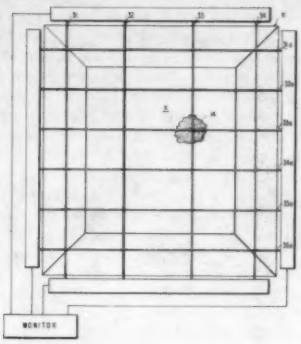
Victor R. Johnson, Jr., 2214 Villa Creek Dr., Kingwood, Tex. 77339

Continuation-in-part of Ser. No. 201,841, Oct. 29, 1980, abandoned, which is a continuation of Ser. No. 180,724, Aug. 25, 1980, abandoned. This application Sep. 1, 1981, Ser. No. 298,414
Int. Cl.³ G01R *31/08, 31/12*; G01M *3/16*
U.S. Cl. 324—54 **18 Claims**

1. A system for detecting leaks from liquid containment means such as a reservoir or conduit, said system comprising:

a geotextile fabric;

a detection network of a plurality of conductive members incorporated into said geotextile fabric, said conductive members being electrically insulated from one another and crossing one another at predictable locations, each said conductive member including a material which is selected to be degradable by the particular liquid to be detected; and



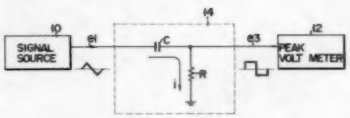
monitoring means connectable to each of said conductive members for separately monitoring at least one electrical property of individual ones of said conductive members and for detecting a change in said electrical property which occurs as a result of degradation of said material by said liquid to be detected.

4,404,517

IMPEDANCE MEASURING DEVICE

Kenji Machida, 2-3-3, Nishiogiminami, Suginami-ku, Tokyo, Japan

Filed Oct. 6, 1980, Ser. No. 194,604
Claims priority, application Japan, Oct. 9, 1979, 54-130177
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 R **12 Claims**



1. A reactance measuring device for determining an unknown capacitance comprising:

signal source means for generating a first voltage signal having a given frequency, a given voltage and a given waveform;

a capacitance element having said unknown cpacitance and having two ends with one end connected to said signal source means for receiving said first signal;

a known resistive element coupled between the other end of said capacitive element and a fixed reference potential, said capacitive and resistive elements constituting a differentiation circuit for differentiating said first signal to provide a second signal; and

measurement means coupled to said differentiation circuit for measuring the value of amplitude of said second signal which is substantially proportional to said unknown capacitance said measurement means including compensation means coupled to said differentiation circuit for compensating non-linearity of the amplitude value of said second signal versus said unknown capacitance so that the relation between the amplitude value of said second signal and said capacitance becomes linear.

4,404,518

METHOD AND DEVICE FOR THE MEASUREMENT OF THE CONTACT RESISTANCE OF GALVANIC SURFACE LAYERS

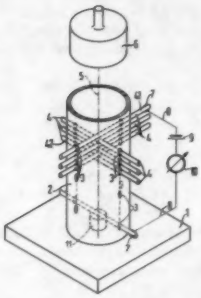
Didier Boone, Oostkamp, and Rolf Cousin, Loppem, both of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,795

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1980, 3028535

Int. Cl.³ G01R 27/02

U.S. Cl. 324—62 6 Claims



1. A system for facilitating measuring contact resistance of galvanic surface layers on wire, comprising: a plurality of wire pieces provided with a galvanic surface layer being positioned through corresponding pairs of apertures of a hollow cylindrical body of insulating material; said pairs of apertures being displaced with respect to one another along a longitudinal axis of the hollow body, being oval or slot-shaped in a direction of the longitudinal axis, and adjacent pairs being positioned relative to one another in a circumferential direction such that the wire pieces in each case pass through the longitudinal axis of the hollow cylindrical body and lie crosswise with respect to one another with one directly above and adjacent to the other; and means for pressing the wire pieces against one another with a defined pressure, whereby total resistance may be measured between an uppermost and lowermost wire piece with other crossed wire pieces in between.

4,404,519

TESTING EMBEDDED ARRAYS IN LARGE SCALE INTEGRATED CIRCUITS

Douglas W. Westcott, Wappingers Falls, N.Y., assignor to International Business Machine Company, Armonk, N.Y.

Filed Dec. 10, 1980, Ser. No. 214,923

Int. Cl.³ G01R 15/12

U.S. Cl. 324—73 R 10 Claims

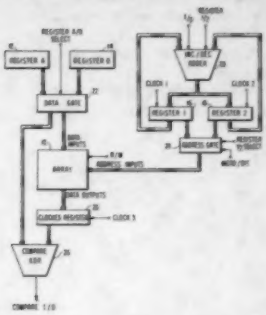
1. In an integrated circuit chip of the type having an embedded memory array surrounded by circuit components, and a plurality of primary input/output pins, said array not being directly accessible from said pins, said array having data inputs and address inputs, said address inputs comprising word lines and bit lines, the improvement comprising the following array-testing chip means which permit complete testing of the array while the array is embedded:

data register means on the chip for supplying test data patterns via the data inputs to be written in selected array cells as selected by addresses on said address inputs;

incrementing address counter means on the chip for providing sequential addresses of the cells in said array;

ripple gate means on the chip for rippling the bit and word addresses applied to said address inputs, said ripple gate means being coupled between said address counter means and said address inputs; and

comparison means on the chip for comparing data read out of the array with expected results and for generating a



signal indicative of the comparison on one of said primary input/output pins.

4,404,520

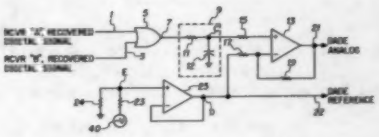
DIFFERENTIAL ABSOLUTE EQUALIZATION MEASUREMENT CIRCUIT

Richard A. Nichols, Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 51,768, Jun. 25, 1979. This application Sep. 21, 1981, Ser. No. 304,428

Int. Cl.³ G01R 23/00, 23/12

U.S. Cl. 324—82 6 Claims



1. A differential absolute delay equalization measuring circuit comprising:

OR gate means for comparing the phase relationship between two digital signals and to provide a first ouput signal thereby;

RC filter means for averaging the first output signal to obtain an average signal;

means for providing a replica pedestal signal; and

summing means for obtaining the difference between the average signal and the replica pedestal signal.

4,404,521

PILFER PROOFING SYSTEM AND METHOD FOR ELECTRIC UTILITY METER BOX

Robert B. Fennell, 241 Deerfield Rd., Bloomingdale, Ga. 31302

Filed Aug. 18, 1980, Ser. No. 179,205

Int. Cl.³ G01R 11/24, 1/04

U.S. Cl. 324—110 7 Claims

1. Pilfer proofing apparatus for a plug-in utility meter and box of the type having a meter base box, a plug-in electric meter having a glass meter cover, rearwardly projecting male connectors and an annular flange, a plug-in terminal block set and a meter box cover having an opening therein through which said glass meter cover of said electric meter passes to plug and engage said rearwardly projecting male connectors in said terminal block set to pilfer proof same without electrically disconnecting the meter base box and terminal block set from the electrical power line, comprising,

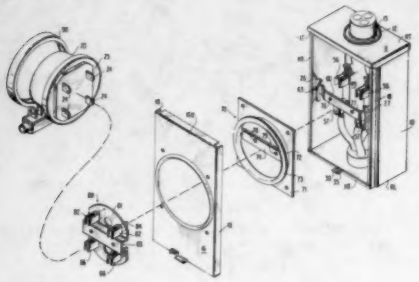
(a) a locking ring member constituted by a meter box cover engaging member and in integral annular locking ring

projection projecting outwardly from the plane of said meter box cover engaging member and through said opening in said meter box cover,

(b) anchor means adapted to be secured to said meter base box,

(c) means securing said locking ring member to said anchor means,

(d) removable insulated blade members releasably retained



in said terminal block set during the installation of elements (a), (b) and (c), and

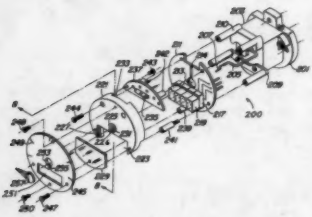
(e) an annular locking ring means engaging said annular flange on the base of said meter and said locking ring projection for securing said meter to said locking ring member and meter base box whereby said projecting male connectors are prevented from being unplugged from said contact terminal block set and said meter base box without removing said annular locking ring.

4,404,522

DISPLAY CONNECTION SCHEME FOR MODULAR ANALOG/DIGITAL INSTRUMENT

Frank Pucciarello, Newark, N.J., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed May 12, 1981, Ser. No. 262,848
Int. Cl.³ G01R *1/00, 1/04*
U.S. Cl. 324—114 **10 Claims**



1. A modular analog/digital instrument display for use in a cylindrical housing comprising:

a base adapted to fit within said housing;

an analog meter movement adapted to fit within said housing and mounted to said base, said meter movement including a rotatable shaft having a portion thereof extending in a direction substantially parallel to the longitudinal axis of said housing;

a circuit board adapted to fit within said housing and mounted in a spaced-apart relationship to said meter movement, said circuit board including electrical contacts formed on at least a portion thereof, said circuit board further having an opening formed therein for receiving said meter movement shaft;

a leadless digital display;

means for mounting said digital display to said circuit board including means for electrically connecting electrical contacts of said digital display with said contacts of said circuit board, said mounting means comprising spacer means disposed between said circuit board and said digital display, electrically conductive means disposed between said digital display and said circuit board for connecting said electrical contacts of said digital display with said electrical contacts of said circuit board, and means for clamping said digital display, electrically conductive means and spacer means to said circuit board;

an analog dial adapted to fit within said housing and mounted to said circuit board, said dial including a first opening for receiving said meter movement shaft and a second opening for exposing said digital display to view; and

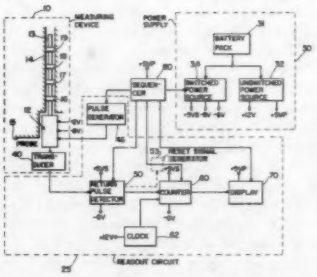
a dial pointer mounted to the end of said meter movement shaft extending through said dial, said dial pointer being arranged adjacent to a face of said dial.

4,404,523

READOUT CIRCUIT FOR LINEAR DISPLACEMENT TRANSDUCER

Michael G. Hughes, Sharon, Vt.; Radu R. Tenenbaum, Hanover, N.H., and Al Bugay, Boulder, Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 10, 1980, Ser. No. 168,823
Int. Cl.³ G01B *7/14*
U.S. Cl. 324—207 **8 Claims**



1. A measurement circuit for a line displacement transducer, wherein the transducer comprises at least one magnet mounted to an object the displacement of which is to be measured, and a magneto-strictive probe disposed adjacent the at least one magnet, said measuring circuit comprising:

pulse generating means for exciting the probe such that a magnetic field is created in the probe which intersects with the magnetic field of the at least one magnet to create a corresponding at least one stress wave in the probe;

controllable counter means for counting at a predetermined rate, said counter means being responsive to a first control signal for commencing a counting and to a second control signal for stopping a counting;

means coupled to the probe and to said counter means for detecting said at least one stress wave and producing said second control signal;

control means coupled to said pulse generating means and to said counter means for controlling said pulse generating means and for producing said first control signal such that said counter begins counting in a predetermined time relationship to the generation of a pulse by said pulse generating means; and

controllable power supply means for supplying power to said pulse generating means, said counting means, and said

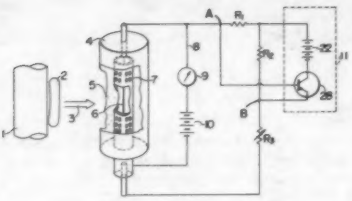
detecting means, and wherein said control means includes means for controlling said power supply such that power is supplied for a predetermined period of time during which a measurement is made.

4,404,524

IONIZATION DETECTOR

Hajime Yamamoto, Hitachi, and Yoshihiko Sato, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 221,019
Claims priority, application Japan, Jan. 7, 1980, 55-113
Int. Cl.³ G01N 27/62
U.S. Cl. 324—459 7 Claims



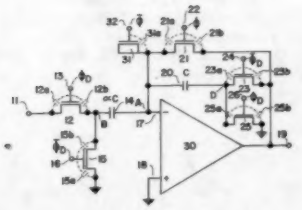
1. An ionization detecting element for ionizing a substance to be measured, comprising:
an insulating member in the form of a rod;
a filament electrode film provided on the surface of said insulating member; and
a thermocouple so supported by said insulating member as to be in contact with said filament electrode film.

4,404,525

SWITCHED CAPACITOR GAIN STAGE WITH OFFSET AND SWITCH FEEDTHROUGH CANCELLATION SCHEME

Gideon Amir; Yusuf Haque, both of San Jose, and Roubik Gregorian, Santa Clara, all of Calif., assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Mar. 3, 1981, Ser. No. 239,945
Int. Cl.³ H03F 1/34
U.S. Cl. 330—9 10 Claims



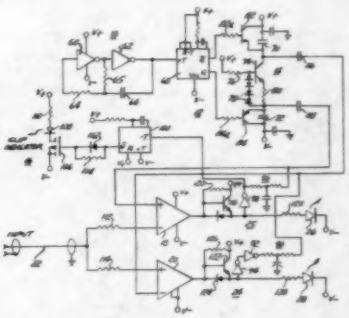
1. A gain stage having an input terminal and an output terminal, said gain stage comprising:
an operational amplifier having an inverting input terminal, a non-inverting input terminal connected to a voltage reference, and an output lead connected to said output terminal;
a switched-capacitor resistor equivalent circuit responsive to a first control signal having a first and a second phase, said switched-capacitor resistor equivalent circuit connected between said input terminal of said gain stage and said input inverting terminal of said operational amplifier;
a capacitor having a first and a second plate, said first plate connected to said inverting input terminal of said operational amplifier;
a first switch means responsive to said first control signal, said first switch means connected between said second plate of said second capacitor and said output terminal of said operational amplifier, whereby said first switch means is open during an initialization period;
a second switch means responsive to said first control signal, said second switch means connected between said second plate of said second capacitor and said voltage reference, whereby said second switch means is closed during said initialization period;
a third switch means responsive to a second control signal having a first and a second phase, said third switch means connected between said inverting input terminal of said operational amplifier and said output terminal of said operational amplifier, whereby said third switch means is closed during said initialization period;
wherein said first control signal is identical to said second control signal and delayed from said second control signal, thereby to provide two non-overlapping control signals and to provide an output voltage on said output terminal of said operational amplifier, said output voltage being free from error components caused by spurious voltages generated by the operation of said first switch means, said second switch means and said switched-capacitor resistor equivalent circuit.

4,404,526

HIGH FIDELITY AUDIO ENCODER/AMPLIFIER

Larry J. Kirn, 24614 Walden Rd. West, Southfield, Mich. 48034

Filed Feb. 2, 1981, Ser. No. 230,397
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 9 Claims



1. An audio encoder/amplifier for coupling, modulating and amplifying an audio signal and providing it to operate a speaker or other load device, comprising: an audio input terminal; means for generating two common source complementary signals, one positive going and the other negative going, including a pair of capacitors, each connected to a common constant current source; comparator means for comparing each of said complementary signals to said audio input signal and producing two pulse width modulated output signals; and switching means having its input connected to said output signals and operably connected to said load device for operating it with relatively high current and high speed.

4,404,527

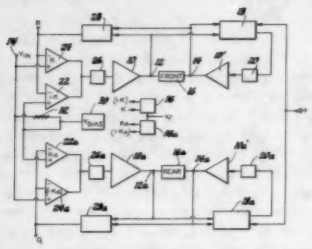
BRIDGE AUDIO AMPLIFIER INCLUDING LOW LEVEL FADE CONTROL

Burtron D. Schertz, and Jerry L. Glandon, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1980, Ser. No. 203,425
Int. Cl.³ H03F 3/68
U.S. Cl. 330—84 6 Claims

1. An audio amplifier comprising an input stage, an output

stage providing inverting and non-inverting outputs for connection with a load, said input stage comprising a bias amplifier and a signal amplifier each having first and second inputs, means applying equal dc bias voltages to said bias and signal amplifiers, means for applying an audio signal to said first input of said signal amplifier, means for converting the combined output current of said bias and signal amplifiers to a voltage



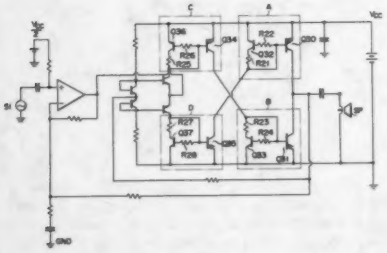
signal and for applying said voltage signal to said output stage, feedback means interconnecting said inverting and non-inverting outputs with said second inputs of said bias and signal amplifiers for establishing the maximum closed loop gain of the amplifier, and means responsive to a variable dc control voltage for reciprocably varying the transconductance of said bias and signal amplifiers to vary the ac gain of said input stage.

4,404,528

OUTPUT AMPLIFIER

Hiroyasu Yamaguchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 11, 1981, Ser. No. 301,439
Claims priority, application Japan, Sep. 16, 1980, 55/128339
Int. Cl.³ H03F 3/04, 3/26
U.S. Cl. 330—288 **3 Claims**



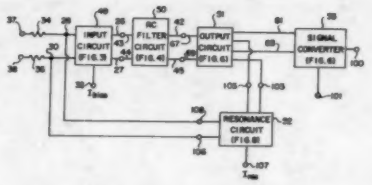
1. An output amplifier comprising:
an output transistor;
a biasing transistor whose emitter is connected to the emitter of said output transistor and whose polarity is the same as the polarity of said output transistor;
a first resistor connected to the collector of said biasing transistor; and
a second resistor connected to the base of said biasing transistor, the other end of said second resistor being connected to the other end of said first resistor, a node of said first and second resistors being connected to the base of said output transistor, and a signal being input at said node;
whereby a circuit comprising said biasing transistor and said first and second resistors operates as a current mirror circuit when a small current is applied and as a resistance circuit when a large current is applied.

4,404,529

LOWPASS FILTER WITH ELECTRONIC CONTROL OF CUTOFF AND RESONANCE

David P. Rossum, 1619 San Andreas Rd., La Selva Beach, Calif. 95076, and Ronald N. Dow, 575 Remington, Apt. 16E, Sunnyvale, Calif. 95087

Filed Dec. 30, 1980, Ser. No. 221,299
Int. Cl.³ H03G 5/22
U.S. Cl. 330—303 **15 Claims**



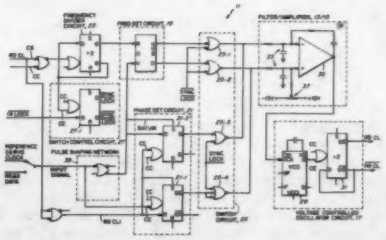
1. An electronic filter circuit, comprising:
a first stage having an input and a differential output for superimposing an input signal upon a bias signal to produce a first differential composite signal current at the output thereof;
a second stage having a differential input connected to said output of said first stage, an output and means connected to said input and said output for producing a second stage differential output current of substantially opposite polarity to the current at the input thereof;
said second stage having a variable input impedance associated therewith, the value of which is functionally related to the magnitude of said bias signal;
said second stage having a cutoff frequency associated therewith, the value of which is functionally related to the value of said input impedance; and
a third stage having first and second differential input terminals and first and second differential output terminals for receiving said second stage differential output current at said input terminals and for converting said current to a differential voltage at said first and second output terminals thereof.

4,404,530

PHASE LOCKED LOOP WITH COMPENSATION FOR LOOP PHASE ERRORS

Arthur N. Stryer, Winchester, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Oct. 22, 1980, Ser. No. 199,659
Int. Cl.³ H03L 7/08
U.S. Cl. 331—1 A **2 Claims**



1. In a phase-locked loop circuit for use in a data recovery system of a rotating magnetic disk drive unit employing a phase encoded signal format and including a phase detector, a filter coupled to the output of the phase detector, an operational amplifier coupled to the filter and a voltage controlled

oscillator coupled to the output of the operational amplifier, in which the phase detector compares an input signal with the output signal of the voltage controlled oscillator and provides a control signal to the voltage controlled oscillator, the improvement comprising: adjustable voltage means for supplying a voltage signal to said operational amplifier sized to offset phase errors caused by the components in said phase locked loop circuit, said adjustable voltage means comprising a positive supply voltage source, a negative supply voltage source and a potentiometer, said potentiometer having a movable arm connected to an input of said operational amplifier and a main leg connected at one end to said positive supply voltage source and at the other end to said negative supply voltage source.

4,404,531

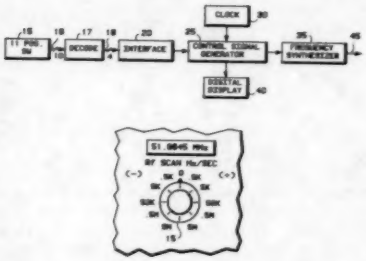
FREQUENCY SCANNING APPARATUS WHEREIN A SINGLE KNOB CONTROLS BOTH STEP SIZE AND DIRECTION OF CHANGE

Thad J. Genrich, Mesa, and Robert H. Bickley, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1980, Ser. No. 156,886

Int. Cl.³ H03B *1/00*

U.S. Cl. 331—64 **9 Claims**



1. Frequency scanning apparatus comprising:

(a) frequency synthesizing means providing an output frequency within a range of frequencies and altering the output frequency in any of a variety of predetermined steps in response to a control signal;

(b) multimode switching means providing an output signal indicative of a selected mode of said switching means, each mode being representative of a different step change of frequency; and

(c) control signal generating means coupled to receive the output signal from said switching means and generating control signals representative of the selected step changes, said generating means including apparatus for supplying to said frequency synthesizing means a predetermined number of the control signals per unit of time to alter the output frequency the predetermined number of the selected step changes per unit of time.

4,404,532

MODULATOR HAVING IMPROVED BANDWIDTH AND POWER REQUIREMENTS

George R. Welti, Leesburg, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 947,313, Sep. 29, 1978, abandoned. This application Mar. 26, 1982, Ser. No. 362,326

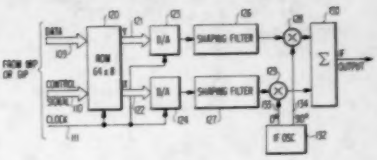
Int. Cl.³ H03C *5/00*; **H03D** *3/18*; **H04J** *9/00*

U.S. Cl. 332—17 **31 Claims**

1. In combination:

means for modulating a carrier signal during first time intervals with a first modulation type, said carrier signal being continuously produced during said first time intervals; and

means for modulating said carrier signal during second time intervals with a second modulation type, said first and second time intervals alternating consecutively with each other, said carrier signal being substantially extinguished



during said second time intervals when the corresponding signal with which said carrier is modulated is of substantially zero amplitude.

4,404,533

ELECTROMAGNETIC SWITCH DEVICE

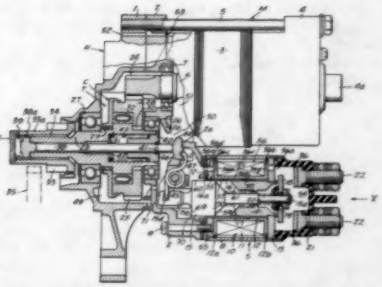
Norimitsu Kurihara, Wako; Katsuharu Kinoshita, Hanno; Masao Watanabe, Niiza, and Toyohiro Sato, Yabuzuka Hon, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,997

Claims priority, application Japan, Mar. 27, 1981, 56-42215[U]; Mar. 27, 1981, 56-42217[U]

Int. Cl.³ H01H *50/02*

U.S. Cl. 335—131 **14 Claims**

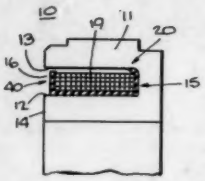


1. An electromagnetic switch device, comprising in combination: a cylindrical housing adapted to be fixed to a stationary member of a device to which said electromagnetic switch device is applied, said housing having a radially extending end wall located adjacent said stationary member; a bobbin accommodated within said housing, a solenoid carried by said bobbin, a cap member fixed to one end of said housing opposite to said end wall of said housing, an annular yoke member interposed between said housing and said cap member and extending radially of said housing, a stationary core positioned inside said bobbin, said cap member defining therein an internal space in cooperation with said yoke member and said stationary core, a movable core movable relative to said stationary core and extending in part through said stationary core into said internal space in said cap member, a fixed contact secured in said cap member, a moving contact mounted on said movable core in face-to-face relation to said fixed contact, resilient means interposed between said movable core and said stationary core and urging said movable core in a direction away from said stationary core; said yoke member, said bobbin and said end wall of said housing being juxtaposed axially of said housing, and air passage means extending through said yoke member, said bobbin and said end wall of said housing to establish communication between said internal space in said cap member with the atmosphere outside of said electromagnetic switch device.

4,404,534
ELECTROMAGNETIC ASSEMBLY

Robert B. Janvrin, Climax, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 14, 1980, Ser. No. 196,888
Int. Cl.³ H01F *27/30*
U.S. Cl. 336—197 **9 Claims**



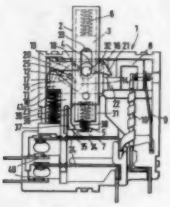
1. An electromagnetic apparatus comprising:
(a) an axially elongated metallic ferromagnetic core having
(i) inner and outer axially extending walls radially spaced from each other to thereby define a cavity for enclosing a coil assembly,
(ii) an annular opening in the core between the walls at one axial end thereof in order to permit the insertion or removal of a coil assembly.
(iii) an annular closure between the walls at the other axial end thereof defining the axial limit of the coil assembly cavity,
(iv) an axial bore extending radial outward from the longitudinal axis of the core to the inner wall, open at both ends of the core and adapted to accommodate a reciprocating armature.
(b) a coil assembly adapted to fit in the core cavity and including
(i) a cylindrical body,
(ii) radial flanges on each end of the cylindrical body and sized to easily pass axially into the annular opening and between the walls of the core and into the core cavity,
(iii) a coil of wire wound around the cylindrical body between the flanges thereof, and
(iv) interference means carried by the coil assembly extending radially beyond the flanges and positioned abutting against at least one core wall in order to primarily support and removably hold the coil assembly in the core cavity between the walls thereof.

4,404,535
PUSH BUTTON POWER SWITCH

Ulrich Fastenrath, Kierspe, and Siegfried Schulte, Lüdenscheid, both of Fed. Rep. of Germany, assignors to Schulte-Elektrotechnik GmbH & Co., KG, Lüdenscheid, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,041
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100789
Int. Cl.³ H01H *71/16*
U.S. Cl. 337—66 **6 Claims**

1. A push button power switch with snap-action contact braking and contact making movements comprising a switch housing, a push button with a hollow stem guided by the housing for vertical downward movements under a push-button-depressing force, a push button plunger guided for vertical movements within the stem, a comparatively weak compression spring serving as a push button return spring by biasing the push button plunger upwardly into the push button in relation to the housing, a comparatively strong compression spring serving as a cock spring between the push button and the upper extremity of the push button plunger, a generally horizontally oriented switching yoke carried by the push button plunger and extending from one side of the push button with a switching extremity and from the other side with a latching extremity, the switching yoke being pivotably connected to the push button plunger in the manner of a balance beam, a latch slide guided by the housing for horizontal movements into and out of engagement under the latching extremity of the switching yoke, including means for biasing the latch slide toward its engaged position, and a switching slide guided by the housing for vertical movements alongside the push button, the switching slide thereby controlling the contact making and contact breaking positions of at least one contact blade in relation to at least one associated stationary contact, the switching extremity of the switching yoke cooperating with the switching slide by pushing it downwardly, in opposition to a slide return spring weaker than the cock spring, when the push button is depressed, while the latching extremity of the switching yoke is engaged by the latch slide to serve as a yoke fulcrum; the switch further comprising a cam slide guided by the housing for horizontal movements into and out of pushing entrainment of the latch slide in the direction of disengagement, and caming means defined by the cam slide and the push button for the creation of a latch-slide-disengaging cam slide movement in a first portion of an upward release



movement of the push button from its fully depressed position, with the effect that the switching yoke is freed to pivot, thereby allowing a snap-action upward movement to be imparted to the switching slide by its return spring, the improvement in said switch comprising:
an abutment member which is movable transversely to the movement direction of the switching slide and which, in its normal position, cooperates with the switching slide and with the switch housing to block the downward movement of the switching slide in relation to the housing, thereby producing a compression of the cock spring, when the push button is depressed;
means for resiliently biasing the abutment member in the sense of a return to its normal blocking position; and
trigger means defined by the abutment member and the push button for the creation of an abutment member release movement, away from its normal position, in response to the push button reaching the vicinity of its fully depressed position, with the effect that the switching slide is freed to execute a snap-action downward movement imparted to it by the cock spring, via the push button plunger and the switching yoke.

4,404,536
ELECTRICAL FUSE

Wolfgang Still, Herdecke, Fed. Rep. of Germany, assignor to Wickmann-Werke AG, Witten-Annen, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,921
Claims priority, application Austria, Sep. 6, 1979, 5896/79
Int. Cl.³ H01H *85/02*
U.S. Cl. 337—201 **20 Claims**

1. In an electrical fuse comprising a carrier of electrically insulating material; a cover of electrically insulating material; means attaching said cover to said carrier to define therewith a housing of electrically insulating material; spaced contactors extending from within to outside of said housing for connecting said fuse into an electrical circuit; and a fusible conductor

connecting said contactors within said housing, the improvement wherein said carrier is in the form of a panel of flat material; said contactors are clamped firmly onto an edge of said carrier; and said cover has spacer projecting parts resting

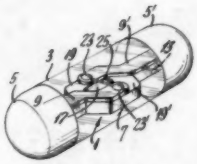
against said carrier to provide a clearance between said cover and said carrier to accommodate said fusible conductor, and projecting catch members comprising said means for attachment of said cover to said carrier.

4,404,537

QUICK-ACTING FUSE

Hiroo Arikawa, Tokyo, Japan, assignor to San-O-Industrial Corp., Tokyo, Japan

Continuation of Ser. No. 131,075, Mar. 17, 1980, abandoned.
This application Mar. 15, 1982, Ser. No. 357,982
Int. Cl.³ H01H *85/16*
U.S. Cl. 337—232 **8 Claims**



1. A quick-acting fuse comprising a fuse base encased within an insulated cartridge, said fuse base consisting of a lower insulating plastic layer and an upper conductive metallic layer coextensively bonded to said lower layer; said fuse base having an enlarged mid-section, a generally elliptical hole in said mid-section, said mid-section necking to a pair of laterally projecting arms on both sides thereof, the ends of said arms being soldered to end caps used to seal the ends of said insulated cartridge, and wherein said metallic layer is partly etched away around said hole to define a pair of spaced apart and opposed conductive terminals with curved tips, a pair of opposed grooves, one in each of said conductive terminals, and a fusible element stretched between said grooves, across said elliptical hole in said fuse base essentially perpendicular to the longitudinal axis of said fuse base.

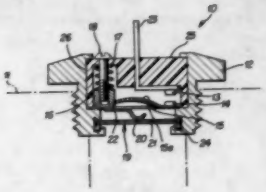
4,404,538

TEMPERATURE SWITCH INCLUDING AMORPHOUS METAL SHEET

Kojiro Mori, Okazaki, Japan, assignor to Aisin Seiki Co., Ltd., Kariya, Japan

Filed Aug. 24, 1981, Ser. No. 295,375
Claims priority, application Japan, Aug. 29, 1980, 55-120099
Int. Cl.³ H01H *37/52*
U.S. Cl. 337—336 **6 Claims**

1. A water temperature switch comprising:
a housing;
a movable contact mounted in said housing for movement between a first and second position;
a fixed contact mounted in said housing and operatively associated with said movable contact for engagement with said movable contact in said second position, and
heat sensitive plate means mounted in said housing and including a thin, corrosion resistant low expansible, amorphous metal sheet and a thin, highly expansible alloy sheet integrally joined together, only said amorphous metal sheet side being exposed to a predetermined water region, the temperature of which is to be determined wherein



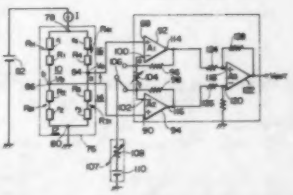
deflection of said heat sensitive plate means is caused by a temperature change in said region for a movement of said movable contact with respect to said fixed contact.

4,404,539

SEMICONDUCTOR STRAIN GAUGE

Kazuji Yamada, Hitachi; Motohisa Nishihara, Katsuta; Hideo Sato, Hitachi; Seiko Suzuki, Ibaraki, and Ryoichi Kobayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,934
Claims priority, application Japan, Feb. 22, 1980, 55/20440
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—3 **6 Claims**

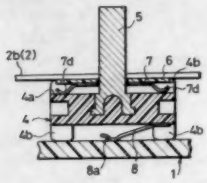


1. A semiconductor strain gauge comprising:
a semiconductor substrate of one conductivity on which a pressure sensitive diagram is formed; and
at least two piezoresistive elements formed in a major surface of said semiconductive substrate adjacent to said pressure sensitive diaphragm and having an opposite conductivity to said one conductivity,
wherein each of said piezoresistive elements includes at least one low impurity concentration diffused portion and at least one heavily-doped diffused portion connected in series, said low impurity concentration portion having a higher resistance temperature coefficient than that of the heavily-doped portion, and further wherein the resistance for each of the respective diffused portions of the piezoresistive elements is set to provide a resistance value of one low impurity concentration diffused portion in one of said piezoresistive elements higher than that of a low impurity concentration diffused portion in the other of said piezoresistive elements and a resistance value of one heavily-doped diffused portion in said one of said piezoresistive elements smaller than that of a heavily-doped diffused portion in said other of said piezoresistive elements, so that said two piezoresistive elements are substantially equal in their overall resistance but unequal in their overall resistance temperature coefficient, with the overall resistance temperature coefficient of said one piezoresistive element being greater than the overall resistance temperature coefficient of said other piezoresistive element.

4,404,540
SLIDE RHEOSTAT

Tsutae Okuya, and Nobuaki Anzai, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Apr. 12, 1982, Ser. No. 367,757
Claims priority, application Japan, Apr. 13, 1981, 56/52910
Int. Cl.³ H01C 10/30
U.S. Cl. 338—161 1 Claim

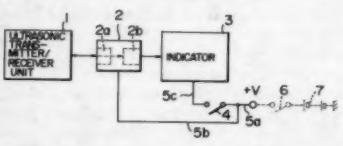


1. A slide rheostat comprising a case, receiver received in said case, a lever extending outwardly of said case from said receiver, a movable insulating plate having a central hole for receiving said lever therethrough, and a leaf spring including a central portion and resilient protuberant pieces disposed at peripheral portions of said central portion, said movable insultating plate and said leaf spring being made unitary by mounting said central portion of the latter on the former, the unitary movable insulating plate and leaf spring receiving said lever therethrough, said protuberant pieces being held in resilient contact with an upper surface of said case through the resiliency of said leaf spring.

4,404,541
REAR OBSTACLE DETECTING SYSTEM FOR AUTOMOTIVE VEHICLES

Masao Kodera; Sigeyuki Akita, and Yasuhisa Yoshino, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 30, 1981, Ser. No. 279,014
Claims priority, application Japan, Jul. 3, 1980, 55-94336[U]
Int. Cl.³ G08G 1/00
U.S. Cl. 340—32 7 Claims



1. A rear obstacle detecting system for an automotive vehicle comprising:

ultrasonic transmitting and receiving means having an electrically operable ultrasonic vibrator mounted at the rear exterior portion of said automotive vehicle;

electrically operable computing means in response to a received signal from said ultrasonic transmitting and receiving means for determining a distance to an obstacle in the backward direction of said automotive vehicle;

electrically operable utilizing means connected to said computing means for utilizing a result of the determination of said computing means;

first detection means for detecting whether said automotive vehicle is in an operating condition or not;

first power supply control means for energizing said ultrasonic transmitting and receiving means by an electric power source of said vehicle in response to the detection of said detecting means that said vehicle is in the operating condition, thereby to vibrate said ultrasonic vibrator so as to be maintained clean so long as said vehicle is operating;

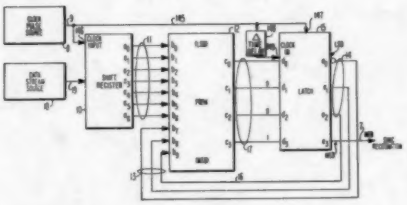
second detection means for detecting a backward movement of said vehicle; and

second power supply control means for energizing said utilization means by said electric power source in response to the detection of the backward movement of said vehicle, thereby to render said utilization means operable only when said vehicle is moving backwardly.

4,404,542
DIGITAL SEQUENCE DETECTOR

Caleb H. Thomas, Jr., Pennsauken, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 5, 1980, Ser. No. 213,394
Int. Cl.³ G06F 7/02
U.S. Cl. 340—146.2 3 Claims



1. A digital sequence detector for detecting a predetermined serial sequence of L bits and comprising:

a shift register having N stages for serially receiving said serial sequence of L bits with the reception of each additional bit constituting a new group of N bits contained in said shift register;

memory means having X memory locations, N+M input terminals, and at least M output terminals;

first means for supplying the contents of said N stages of said shift register to said N input terminals of said memory means;

second means for supplying the signals on said M output terminals of said memory means to the M input terminals of said memory means;

said second means comprising means for delaying the supplying of the signals appearing on the M output terminals of said memory means to the M input terminals thereof until the next bit of said expected sequence has been entered into said shift register means to form a next successive group of N signals;

said memory means responsive to each next successive group of N signals supplied thereto from said shift register and the delayed signals on the M output terminals of said memory means to produce a predetermined sequence of binary patterns on said M output terminals thereof as long as the predetermined sequence of L bits is being correctly received into said shift register; and

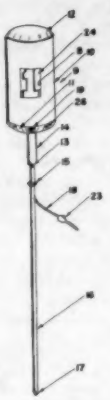
means responsive to the last predetermined binary pattern supplied from said memory means to indicate the reception of the complete sequence of L binary bits received by said shift register;

said memory means being responsive to any group of N bits in said shift register which varies from any expected group of N bits to output the first binary pattern in said sequence of binary patterns.

4,404,543
DOWN MARKER INDICATOR FOR FOOTBALL COMPETITION

David L. Kracl, 14406 Tiburon Rd., San Leandro, Calif. 94577

Filed Aug. 3, 1981, Ser. No. 289,480
Int. Cl.³ G08B 23/00; A63B 71/06
U.S. Cl. 340—323 R 2 Claims



1. Down marker indicator for use with football sideline chains and comprising, in combination:

(a) an inner cylinder, with a sleeve that rotates or moves up and down on a vertical axis, numerical down indicia printed on the outer surface of said cylinder,

(b) an outer cylinder having a dome top and bottom, three evenly spaced viewing openings around the outer circumference of the outer cylinder for viewing said numerical down indicia,

(c) a vertical axis center pole having a rounded tip at its base, said center pole attached to the outer cylinder dome top by means of male and female thread fittings and including a collar and push button release means for positioning said outer cylinder,

(d) means for illuminating said down marker indicator, switch means connecting said illuminating means to an external portable power source means for energizing said illuminating means,

(e) said outer cylinder further including two movable dials with numerical indicia printed thereon attached to the circumferential edge of the dome bottom.

4,404,544
μ-LAW/A-LAW PCM CODEC

Mirmira R. Dwarakanath, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1981, Ser. No. 252,600
Int. Cl.³ H03K 13/02, 13/08
U.S. Cl. 340—347 AD 9 Claims

1. In a PCM CODEC, a capacitor array designed to be configured for either μ-law or A-law coding, said array comprising

a binary-weighted set of capacitors,

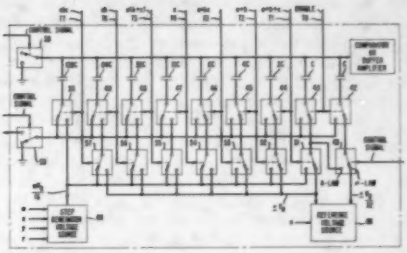
an additional capacitor having the same value as the lowest-valued capacitor in said set,

means connecting one plate of each of said capacitors to a common node point,

first means for connecting the other plate of said additional capacitor either to a fixed fraction of the opposite polarity of a reference voltage thereby to configure said array of capacitors for μ-law coding or for connecting said additional capacitor and the lowest-valued capacitor in said set in parallel thereby to configure said array of capacitors for A-law coding,

second means for connecting the other plate of the highest-valued capacitor in said set either to a point of reference potential such as ground or to a variable fraction of said reference voltage,

and third means for connecting the other plate of each of said capacitors in said set except the lowest-valued and highest-valued capacitors thereof to said point of reference potential, to a variable fraction of said reference voltage or to said reference voltage,

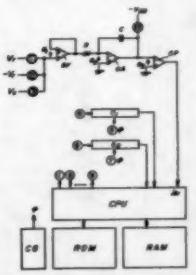


wherein said first, second and third means constitute a cascaded arrangement of switches for connecting the other plate of each of the capacitors in a consecutive subset of said set of capacitors to said reference voltage and at the same time automatically connecting the other plate of the next higher-valued capacitor of said set to a variable fraction of said reference voltage.

4,404,545
ANALOG-TO-DIGITAL CONVERTER OF THE DUAL SLOPE TYPE

Tousaku Nakanishi, Nara, and Hiroshi Tsuda, Uji, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 11,913, Feb. 13, 1979, abandoned. This application Apr. 28, 1981, Ser. No. 258,313
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 NT 4 Claims



1. A semiconductor electronic circuit for determining an unknown voltage value while compensating for an offset error voltage present in said circuitry comprising:

a first switched input means for selectively receiving a first reference voltage;

a second switched input means for selectively receiving a second reference voltage equal to said first reference voltage but reversed in polarity;

a third switched input means for selectively receiving an unknown voltage value;

an integrator including a differential amplifier and a feed-

back capacitor, said integrator being connected to said first, second, and third switched input means and having an output;

said first switched input means selectively receiving and providing said first reference voltage to said integrator during a first predetermined time period to produce a first integrated voltage value at the output of said integrator, said first predetermined time period beginning when said integrator produces an output greater than zero;

said second switched input means selectively receiving and providing said second reference voltage to said integrator after said first predetermined timed period is completed and until the output of said integrator equals zero;

means for measuring the duration of the integration of the input applied by said second switched input means after said first predetermined time period to form a first measured time period;

said third switched input means selectively receiving and providing said unknown voltage to said integrator during a second predetermined time period to produce a second integrated voltage value at the output of said integrator, said second predetermined time period beginning when said integrator produces an output greater than zero;

said second switched input means selectively receiving and applying said second reference voltage to said integrator after said second predetermined time period is completed and until output of said integrator is zero;

means for measuring the duration of the integration of the input applied by said second switched input means after said second predetermined time period to form a second measured time period; and

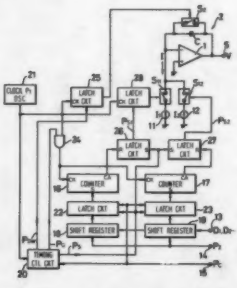
means for determining the value of said unknown voltage using said first and second predetermined time periods, said first and second measured time periods and said first reference voltage.

4,404,546

DIGITAL-TO-ANALOG CONVERTER

Ikuro Hata, Hiratsuka, and Masashi Takeda, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,698
Claims priority, application Japan, Dec. 15, 1980, 55-176888
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **14 Claims**



1. A digital to analog converter circuit for converting digital words of n bits into a corresponding analog level, comprising

integrating means having an input to which charging current is applied and an output from which said analog level is derived;

a plurality of current sources each providing a constant current at a different respective predetermined level;

a plurality of switching means each associated with a respective one of said current sources for coupling the same to said integrating means to provide charging current thereto;

a plurality of digital counters each corresponding to a respective one of said switching means and holding a predetermined portion of said n bits, the digital counters in the aggregate holding all said n bits, each said counter being coupled to its respective switching means to provide a switching signal when the contents thereof reach a predetermined count;

clock generator means providing clocking signals to said digital counters; and

means for receiving said n-bit digital words, dividing the same into a plurality of fragments, and loading each such fragment into a respective one of said counters;

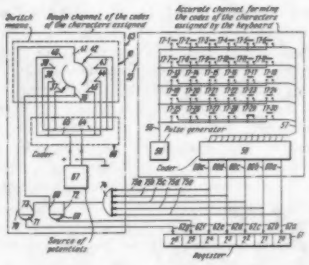
the circuit being so configured that when said fragments have been loaded into said counters, said counters begin counting said clocking signals and said switching means are closed for supplying said charging current to said integrating means, and when the contents of each of said counters reaches said predetermined count, that counter provides said switching signal to open the associated switching means to cut off the charging current from the respective current source.

4,404,547

DATA INPUT KEYBOARD

Valentin P. Zybailo, ulitsa Ya.Kolasa, 62, kv.20; Anatoly N. Kniga, ulitsa Volgogradskaya, 1, korpus 3, kv. 41; Ljudmila E. Kosyan, Leninsky prospekt, 104, kv. 28; Valentin P. Rudenko, ulitsa Knorina, 11/2, kv. 95, and Sergei A. Poltaev, 1 Junoshesky pereulok, 18/60, all of Minsk, U.S.S.R.

Filed Jun. 11, 1981, Ser. No. 270,417
Int. Cl.³ G06F *3/02*; H01H *19/58, 21/78*
U.S. Cl. 340—365 R **9 Claims**



1. A data input keyboard comprising

a panel,

a plurality of keys arranged on said panel in the form of a matrix of "m" lines and "n" columns,

each of said keys being provided with a resilient member, a pusher and a contact pair coupled to said pusher,

said contact pairs of said keys defining an accurate channel of forming the codes of characters being assigned by the keyboard;

a switch means provided with a plurality of contact pairs, in each of which one of the contacts is movable, while the other is stationary,

said contact pairs of said switch means defining a rough channel of forming the codes of said characters; and

a rotation transfer mechanism provided with an input shaft with a rotation member and "m" output shafts,

said rotation transfer mechanism being coupled to said contacts of said contact pairs of said switch means for switching said rough channel,

each of said keys having the shape of a cylinder with faces

on peripheral surfaces thereof carrying the inscriptions of said characters,

each of said keys being capable of rotation about the longitudinal axis of the cylinder,

said keys of the "m" lines of said matrix being mounted on one of said output shafts of said rotation transfer mechanism, and

each of said keys being mounted on said output shaft of said rotation transfer mechanism to be capable of shifting towards its pusher.

4,404,548

METHOD FOR TRANSMITTING MEASURING VALUES IN A FIRE ALARM SYSTEM AND APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

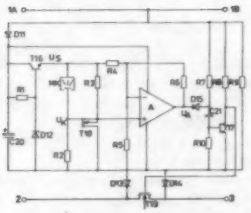
Peter Mueller, Oetwil am See; Eugen Schibli; Andreas Scheidweiler, both of Uerikon, and Jurg Muggli, Mannedorf, all of Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Jun. 8, 1981, Ser. No. 271,187

Claims priority, application Switzerland, Jun. 23, 1980, 4803/80

Int. Cl.³ G08B *26/00*

U.S. Cl. 340—505 **12 Claims**



1. In a method of transmitting measuring values in a fire alarm installation wherein measuring values determined by individual fire alarms connected in series at alarm reporting lines are transmitted in recurrent interrogation cycles to a central signal station beginning with a fire alarm closest to the central signal station and terminating with a last fire alarm located furthest from the central signal station, the transmitted measuring values are linked at the central signal station for obtaining differentiated disturbance or alarm signals, whereby at the start of each interrogation cycle for all fire alarms there is disconnected the alarm reporting line by a voltage change, then there is again reconnected in a timewise staggered fashion the reporting lines such that each fire alarm after a certain time-delay connects a subsequently arranged fire alarm with the line voltage whereby there is caused an increase of current in the reporting line, and there is derived in an evaluation device from a number of preceding increases in the line current a momentary fire alarm address; the improvement which comprises the steps of:

returning the alarm reporting lines from the last fire alarm in each reporting line to terminals of the central signal station; and

upon absence of fire alarm signals reversing an interrogation direction for the affected alarm reporting line.

4,404,549

LATCHING PORTABLE PERSONAL SECURITY ALARM

Richard Berg, 12520 Easton Dr., Saratoga, Calif. 95070

Filed May 11, 1981, Ser. No. 262,307

Int. Cl.³ G08B *15/00*

U.S. Cl. 340—574 **12 Claims**

1. A portable alarm device comprising:

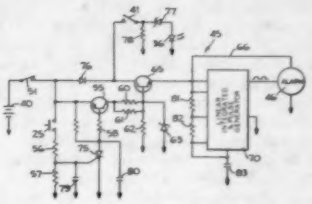
(a) a housing;

(b) means on said housing for supporting said housing on the person of an operator;

(c) an alarm on said housing; and

(d) a control circuit in said housing for controlling the operation of said alarm,

(e) said control circuit including a manually actuable switch



on said housing to activate said control circuit for operating said alarm, said control circuit once activated continuously operates said alarm until said control circuit is deactivated, said control circuit including an alarm deactivating switch on said housing manually actuable to deactivate said control circuit for discontinuing the operation of said alarm.

4,404,550

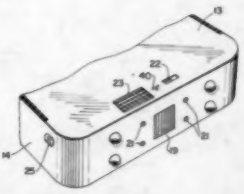
SMOKE DETECTOR - LUGGAGE COMBINATION

Jack B. Shaw, 2710 Bedford St., Johnstown, Pa. 15904

Filed Apr. 7, 1981, Ser. No. 251,931

Int. Cl.³ G08B *17/10*

U.S. Cl. 340—628 **9 Claims**



1. A luggage-type device including a smoke detector, said luggage comprising an upper and lower portion and side portion, said upper portion being hinged to said side portion, with means to join said upper and side portions when said luggage is transported, said side portion including a semi-rigid support portion having supported thereon a smoke detecting device, a vent means communicating said smoke detector to outside said luggage, said vent passing through said side portion of said luggage and power supply means to supply power to said smoke detector.

4,404,551

PLURAL VIDEO KEYBOARD ACCESS SYSTEM

Peter Howse, Pembury; Dennis Cookson, Chelmsford, and Stephen P. Lane, Gillingham, all of England, assignors to Reuters Limited, London, England

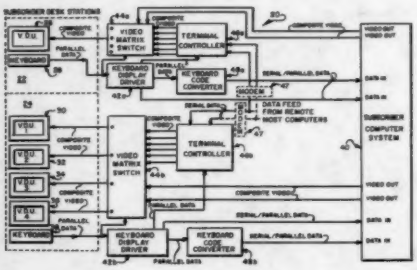
Filed Apr. 14, 1981, Ser. No. 254,136

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—711 **24 Claims**

1. In a video communication network capable of providing a plurality of simultaneous different textual data video frames to a plurality of keystations, said video frames comprising textual data provided from a plurality of computer systems each capable of providing a portion of said plurality of simultaneous textual data video frames to said network, each keystation comprising a single keyboard means for inputting at least data

control signals to said plurality of computer systems for controlling the provision of said textual data from said computer systems, each keystation further comprising at least one associated video display means for selectively video displaying one of said plurality of simultaneously provided textual data video frames, each of said simultaneously provided different textual data video frames being definable by a different simultaneously provided composite video input signal to said keystation, each keystation comprising means for receiving said plurality of simultaneously provided composite video input signals; the improvement comprising keyboard display driver interface means selectively connected between said single keyboard means at each keystation and any one of said plurality of computer systems in an enabled state for dynamically selectively connecting said single keyboard means at any keystation to any one of said computer systems for enabling communication therewith in said enabled state, said plurality of computer systems comprising at least two different data bases having incompatible keyboard protocols or character codes; and video matrix switch means operatively connected to said video display means, to said keyboard means and to said composite video signal receiving means at at least one of said plurality of keystations in said network for multiplexing said plurality of simultaneously provided composite video input signals and detecting a plurality of unique keyboard generated character codes from said keyboard means of said one keystation for enabling dynamic selection of any one of said plurality of



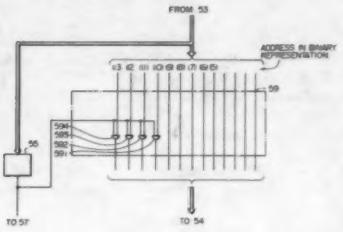
simultaneously provided different composite video input signals provided to said video matrix switch means in response to detection of at least a predetermined one of said unique keyboard generated character codes for dynamically routing any one of said simultaneously provided composite video input signals to said video display means of said one keystation for enabling said video display of said corresponding selected textual data video frame, said keyboard display driver interface means being capable of detecting a plurality of unique keyboard generated character codes from said keyboard means for enabling said dynamic selective connection of said keyboard means to one of said different data base computer systems for enabling said enabled state communication therewith, said network further comprising keyboard code conversion means operatively connected between said keyboard display driver interface means and said one keyboard means for converting incompatible keyboard character codes or protocols from said one keyboard means into keyboard character codes or protocols compatible with each of said different data bases dependent on the data bse to be selectively communicated with through said one keyboard means; whereby a single keystation keyboard may be used both to selectively communicate with a plurality of different data base computer systems having incompatible keyboard protocols or character codes and to enable keyboard generated dynamic selection of a textual data video display from a plurality of simultaneously provided composite video signals from said plurality of different data base computer systems.

4,404,552

DISPLAY DEVICE FOR BOTH A CHARACTER DISPLAY AND A GRAPHIC DISPLAY

Shigeru Hirahata; Tetsuya Ikeda; Tsuguji Tachiuchi; Shigeru Komatsu, and Teruhiro Takezawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 23, 1980, Ser. No. 220,142
Claims priority, application Japan, Dec. 27, 1979, 54-169414
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—721 **5 Claims**



1. In a display device for both character display and graphic display including:

a display means having a display panel on which both the character information and the graphic information are displayed at areas, each area including pixels with the pixels arranged in a pixel line,

a display signal generating means for supplying said display means with display signals;

a central processor unit for controlling said display signal generating means,

a program memory means for storing an operating program for said display device, and

an address bus and a data bus for establishing communication between said central processor unit, said program memory means and said display signal generating means;

said display signal generating means comprising;

a timing pulse generating means,

an address switching means for switching address signals from said central processor unit and address signals from said timing pulse generating means,

a display memory means capable of storing picture information for each pixel, character information being stored in the form of character codes and the graphic information in the form of pixel pattern data in the predetermined addresses of the sections of the memory field, the same character codes being used for the pixel lines belonging to one character area and the respective pattern data being used for area including the contour of graphic figure,

a discrimination signal memory means for storing and supplying the signal indicating the kind of said picture information, either character or pattern,

a character pattern memory means receiving signals from said display memory means and producing pixel pattern data corresponding to the character information, and

a switching means for switching signals from said display memory means and signals from said character pattern memory means under the control of signals from said discrimination signal memory means,

the improvement comprising:

an address conversion means receiving inputs from said address switching means and providing outputs to said display memory means,

discrimination signals produced from said discrimination signal memory means being supplied to said address conversion means to control the address conversion in said address conversion means for supplying output signals to said display memory means, such that

said address conversion means, when the output of said

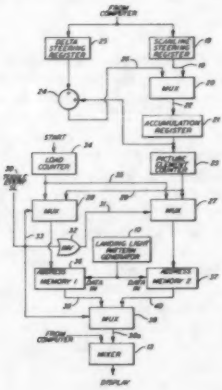
discrimination memory means is indicative of a character, converting addresses of a plurality of pixel lines belonging to one character area into a single predetermined address or a number of addresses smaller than said plurality, and address signals produced from said address switching means being supplied both to said address conversion means and said discrimination signals memory means.

4,404,553

LANDING LIGHT PATTERN GENERATOR FOR SIMULATOR WITH SELECTIVE ADDRESSING OF MEMORY

Robert P. Cuffia, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed Nov. 7, 1980, Ser. No. 204,975
Int. Cl.³ G09G 1/00
U.S. Cl. 340—728 10 Claims



1. In a system for developing a predetermined simulated scene at a time of reduced visibility from information obtained from data generated digitally and from data stored electronically, and for displaying said reduced visibility scene on a display device with portions of increased illumination as if by a spot light, said system comprising:

data storage means for receiving data representative of predetermined scenes,

control means for generating data in order to select a predetermined scene,

a display device connected to receive data from said data storage means and to display scenes selected by said control means,

means connected to said display device to increase the illumination intensity of portions of said displayed reduced visibility scene in accordance with a preselected pattern as if projected by a spot light and unrelated to the information in said scene, and

said means connected to said display device including memory circuit means to store data representative of a Table of Intensities with means for addressing the Table of Intensities at different points,

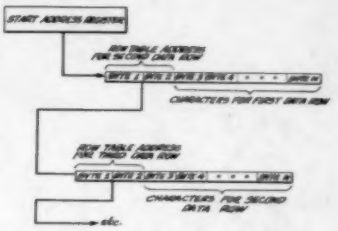
whereby the preselected spot light pattern of increased illumination intensity is moved in a predetermined manner.

4,404,554

VIDEO ADDRESS GENERATOR AND TIMER FOR CREATING A FLEXIBLE CRT DISPLAY

John F. Tweedy, Jr., Bellerose Villa, and Morton B. Herman, Huntington, both of N.Y., assignors to Standard Microsystems Corp., Hauppauge, N.Y.

Continuation of Ser. No. 194,435, Oct. 6, 1980, abandoned. This application Nov. 10, 1982, Ser. No. 440,598
Int. Cl.³ G09G 1/16
U.S. Cl. 340—750 9 Claims



1. In a CRT video display system including a microprocessor, a memory, a video processor and controller, a data bus coupling said video processor and controller to said microprocessor and to said memory, and an address bus coupling said video processor and controller to said microprocessor and to said memory, said video processor and controller comprising a plurality of registers programmable by said microprocessor to store selected address characters and control characters, a first portion of said register plurality being connected to said data bus and a second portion of said register plurality being connected to said data bus and to said address bus, said memory containing information for a plurality of data rows, the information for each of said data rows being in the form of a plurality of bytes defining the characters for the data row and at least one preceding byte defining the starting address of the succeeding data row, said second portion of said register plurality including a start address register for defining a memory address to commence an addressing procedure, an address register, and logic and control means for retrieving from said memory said at least one succeeding-row address byte and for storing said at least one succeeding-row address byte in said address register until the time for displaying the succeeding data row, and means for accessing said registers via said address bus and said data bus and for utilizing said selected address characters and control characters stored in said registers.

4,404,555

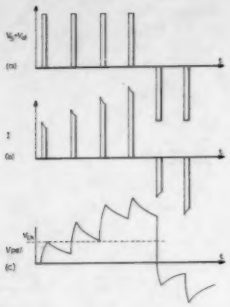
ADDRESSING SCHEME FOR SWITCH CONTROLLED LIQUID CRYSTAL DISPLAYS

John R. Long, Vanier; Carla J. Miner; Richard W. Streater, both of Nepean, and David R. Baraff, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 9, 1981, Ser. No. 271,973
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 6 Claims

1. A method for addressing individual picture elements of a matrix multiplexed liquid crystal electrical field dependent optical transmissivity display, the display comprising a pair of plates, at least one of the plates being transparent, the plates having sealed therebetween a layer of liquid crystal, a first row-column array of electrodes on an inside surface of one plate and a corresponding second row column array of electrodes on an inside surface of the other plate, the display having a plurality of picture elements, each element defined by a pair of electrodes one from said first array and one from said second array, the electrodes of one plate being electrically interconnected by column leads, the electrodes on the other plate being electrically interconnected by row leads, each

picture element having a series connected thin film switch, said switches being formed on the inside surface of at least one of the plates, said method for addressing individual picture elements comprising: applying scan voltage pulses to successive



ones of the row leads and applying data voltage pulses of opposite polarity to selected ones of the column leads wherein the polarity of said scan and data pulses is periodically reversed, said periodic reversal taking place between successive series of unipolar pulses.

4,404,556

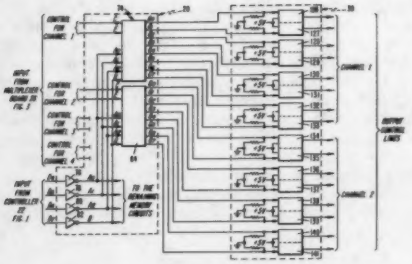
BIT EXPANSION CIRCUIT

Joseph A. Messina, North Andover, and William R. Sullivan, Andover, both of Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 25, 1981, Ser. No. 325,152

Int. Cl.³ H04Q *9/00*; H04J *3/00*

U.S. Cl. 340—825.03 **16 Claims**



1. A bit expansion circuit for increasing the number of outputs available from a n-bit parallel output port of a programmable controller, comprising:

means for coupling the output port of the programmable controller to the bit expansion circuit;

a plurality of output channels each having a plurality of output lines wherein the total number of output lines of the plurality of channels exceeds the number of outputs available from the n-bit parallel output port;

a first means for decoding a plurality of channel-select bits fed from the programmable controller through the coupling means to the bit expansion circuit to select and enable any one of the plurality of output channels;

a second means for decoding a plurality of line-select bits fed from the programmable controller through the coupling means to the bit expansion circuit to select and enable any one of the plurality of output lines associated with the output channel enabled by the first decoding means; and

means for latching the output line selected by the second decoding means in the most recent output state when the first decoding means disables the selected channel.

4,404,557

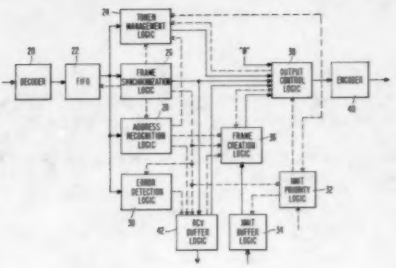
TIMED TOKEN RING WITH MULTIPLE PRIORITIES

Robert M. Grow, Newtown, Conn., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 5, 1982, Ser. No. 355,021

Int. Cl.³ H04Q *9/00*; H04L *11/00*; H04J *6/02*

U.S. Cl. 340—825.05 **24 Claims**



1. A method of allocating bandwidth in a loop communications network, said network including a loop-connected set of stations providing data flow unidirectionally from one of said stations to the next, each of said stations being capable of passing data through itself along the loop, extracting data from the loop or injecting data into the loop, each of said stations having associated with it at least one identifier address, each of said stations being assigned a Class 1 priority, a Class 2 priority, or both of said Class 1 and Class 2 priorities, the right of each of said stations to source new information into the network controlled by passing a write token from one of said stations to another, said method comprising the steps of:

a. each of said Class 2 stations timing the rotation time of the write token to measure instantaneous load; and

b. each of said Class 2 stations limiting the transmission of information onto the loop based on the observed write token rotation time.

4,404,558

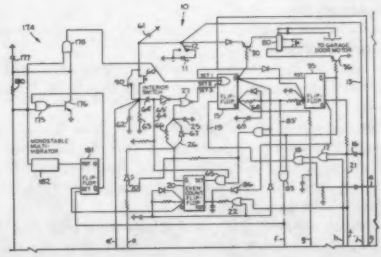
ELECTRICAL CONTROL CIRCUIT FOR OPERATING A GARAGE DOOR OR SIMILAR DEVICE

Anderson Yen, 4011 Cranford Cir., San Jose, Calif. 95124

Filed Apr. 15, 1981, Ser. No. 254,453

Int. Cl.³ G08C *19/00*

U.S. Cl. 340—825.72 **25 Claims**



1. A circuit for controlling the operation of a garage door or the like through the activation of a garage door device or similar device comprising:

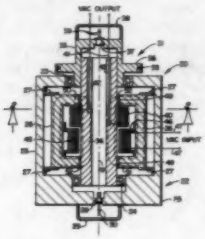
(a) means for activating the garage door device;

(b) a counting circuit including a timing circuit for activating said means in response to receiving a predetermined number of pulses within a predetermined time period; and
(c) switch means connected to said counting circuit for sending said predetermined number of pulses within said time period to said counting circuit for operating said garage door device.

4,404,559
ROTATIVE POWER AND SIGNAL COUPLING

G. Frederick Renner, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed May 26, 1981, Ser. No. 267,206
Int. Cl.³ H04B 9/00
U.S. Cl. 340—870.28 5 Claims



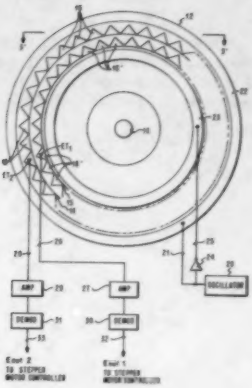
1. A rotative coupling for transferring electrical power and information between a rotating part and a stationary part, comprising:
a. a stationary core means mounted on the stationary part;
b. an annular, stationary coil mounted on the stationary part, and encircling a hollow, rotative core means of magnetic material constructed to rotate in the stationary core for establishing a flux path;
c. an annular, rotative coil mounted on the rotating part, encircling the hollow, rotative core means, the stationary core means including a core portion of magnetic material around the outer perimeter of the coils establishing continuous flux paths through the hollow rotative core means;
d. means for connecting one of the coils to a source of alternating electrical potential and means for connecting the other coil to an electrical load; and
e. a plurality of optical transceivers mounted at opposing positions on the axis of rotation of the hollow rotative core means, transmitting and receiving information to and from the stationary and rotating parts on a modulated beam of light passing through and along said axis of rotation of the hollow, rotative core means.

4,404,560
CAPACITIVE TRANSDUCER FOR PROVIDING PRECISE ANGULAR POSITIONAL INFORMATION

Errol R. Williams, Jr., Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1981, Ser. No. 261,401
Int. Cl.³ G08C 19/16
U.S. Cl. 340—870.37 6 Claims

1. A capacitive transducer comprising:
a first member having a first track of a plurality of sequential conductive segments of the same shape and size,
a second member having a second track of a plurality of sequential conductive segments spaced from and facing said first track,
means for rotating one of said members with respect to the other whereby the track on said rotating member rotates with respect to the track of the other member,
means for applying an alternating electrical signal to the first of said tracks of conductive segments, and
means connected to the second track of conductive segments for sensing the capacitive effect induced in said second track of conductive segments by said electrical signal,

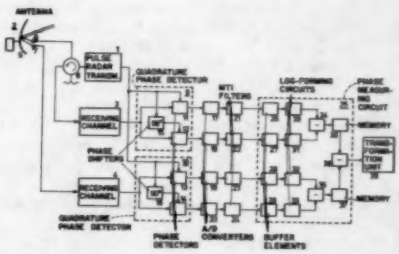


at least one of said tracks having a plurality of triangular shaped segments each having one side radial to the axis of rotation of said moving member.

4,404,561
RADAR SYSTEM

Willem Mulder, Borne; Gerrit van Rooyen, Haaksbergen, and Johan M. C. Zwarts, Borne, all of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

PCT No. PCT/NL80/00006, § 371 Date Nov. 10, 1980, § 102(e) Date Nov. 10, 1980, PCT Pub. No. WO80/01956, PCT Pub. Date Sep. 18, 1980
PCT Filed Feb. 13, 1980, Ser. No. 224,514
Claims priority, application Netherlands, Mar. 14, 1979, 7902009
Int. Cl.³ G01S 3/48
U.S. Cl. 343—16 R 4 Claims



1. A radar system for determining the angle of elevation of a detected target, comprising:
(a) an antenna including a reflector and two vertically mounted receiving elements for cooperating to form almost coinciding, substantially cosecant-squared beam patterns;
(b) two receiving channels electrically-connected to the receiving elements for processing signals from the elements;
(c) a phase measuring circuit electrically-connected to the receiving channels for measuring the phase difference $\Delta\phi$ between signals processed by the channels; and
(d) a transformation unit electrically-connected tc the phase

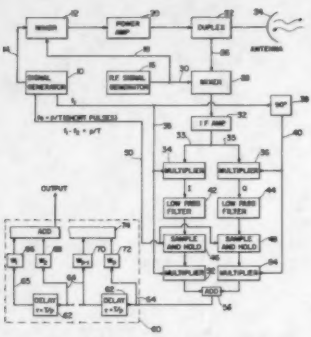
measuring circuit for converting the phase difference into a signal representative of the elevation angle ϵ of the target.

4,404,562

LOW SIDELOBE LINEAR FM CHIRP SYSTEM

Frank F. Kretschmer, Jr., Laurel, and Bernard L. Lewis, Oxon Hill, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1980, Ser. No. 180,548
Int. Cl.³ G01S *13/28*
U.S. Cl. 343—17.2 PC **19 Claims**



1. A pulse compression system for receiving and compressing the echos of long frequency modulate (FM) pulse waveforms of electromagnetic energy propagated by a transmitter comprising:

means for receiving a long FM pulse signal including means for converting the received signal to an intermediate frequency (I.F.) signal;

means for sampling the output signal from said receiving means and holding said sampled receiver output signal as its output until the next sampling time,

wherein said sampling and holding means comprises

a first electrical channel for generating a baseband I signal from said I.F. signal output from said converting means and sampling this signal at the Nyquist rate for said baseband signal and then reconverting this I signal back to an I.F. signal;

a second electrical channel for generating a baseband Q signal from said I.F. output from said converting means and sampling this signal at the Nyquist rate for said baseband signal and then reconverting this sampled Q signal back to an I.F. signal; and

first adding means for adding the I.F. signal outputs from said first and second electrical channels; and

discrete phase correlation compression means for compressing a predetermined number of sampled outputs from said first adding means in said sampling and holding means into a short pulse.

4,404,563

SYSTEM OF DIRECTIONAL ANTENNAS WITH MEANS FOR REDUCING FLUTTER

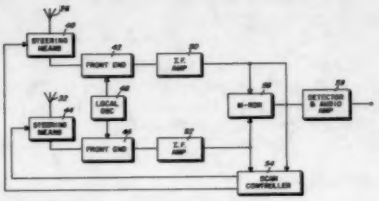
Roy A. Richardson, Skokie, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 12, 1980, Ser. No. 206,217
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 SA **17 Claims**

1. A method of reducing flutter in received radio frequency signal transmissions comprising the steps of:

a. providing first and second antenna devices having selectable directional receiving patterns;

b. fixing the receiving pattern of one of the directional receiving antennas to receive a selected signal while sweeping the receiving pattern of the other directional receiving antenna to produce a second signal;



c. selecting the antenna pattern that is fixed at any particular time as the one producing the stronger signal; and

d. combining the received signals to produce an output.

4,404,564

ATTACHMENT FOR ANTENNAS TO IMPROVE RECEPTION AND TRANSMISSION

George P. Wilson, North Andover, Mass.

Continuation-in-part of Ser. No. 110,644, Jan. 9, 1980, Pat. No. 4,321,603. This application Feb. 8, 1982, Ser. No. 346,766
Int. Cl.³ H01Q *1/32, 9/36*
U.S. Cl. 343—750 **7 Claims**

1. A device adapted to be attached to an omni-directional antenna having an elongated conductive element comprising:

an inner metallic sleeve disposed in spaced axial relationship about said elongated conductive element, and

an outer open-wound coil having coil turns disposed in spaced relationship about, said inner metallic sleeve,

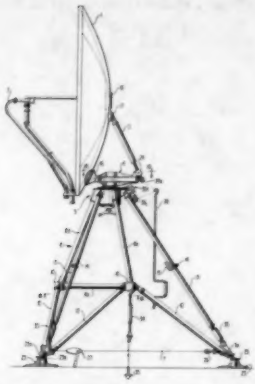
said inner metallic sleeve and said outer open-wound coil being electrically isolated from each other and from said elongated conductive element,

said outer open-wound coil turns being wound at an angle to said inner metallic sleeve.

4,404,565
QUICKLY ERECTABLE ANTENNA SUPPORT STRUCTURE

John W. Gurney, Reston; James N. Guercl, McLean, and Clifford Allison, Jr., Oakton, all of Va., assignors to Radiation Systems Incorporated, Sterling, Va.

Filed Nov. 18, 1981, Ser. No. 322,601
Int. Cl.³ H01Q 1/08
U.S. Cl. 343—881 18 Claims

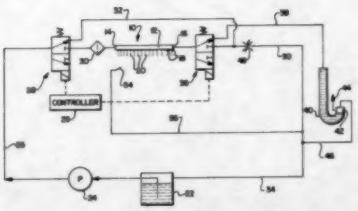


1. A collapsible support structure comprising:
an apex assembly;
at least three corner members positioned in co-planar relation with each other and at a preselected distance from the apex assembly;
a first plurality of frame members connected at opposite ends thereof between the apex assembly and the corner members;
at least three footpad means adapted to rest upon a surface;
a plurality of folding frame members pivotally connected between the apex assembly and respective footpad means;
a second plurality of frame members, each footpad means connecting first ends of at least two such frame members while opposite ends thereof are pivotally connected to the adjacent corner members in closest proximity to the footpad means; and
a tensioned cable engaging a point in proximity to each footpad means for maintaining the structure erect thus minimizing bending forces on the frame members.

4,404,566
FLUID SYSTEM FOR FLUID JET PRINTING DEVICE

Frederic L. Clark, Plano, and Scott D. Ayers, Garland, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 8, 1982, Ser. No. 355,421
Int. Cl.³ G01D 15/18
U.S. Cl. 346—1.1 21 Claims

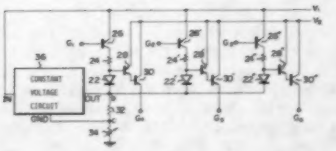


7. A method of starting up a jet printer having a print head with a manifold initially filled with a fluid, at least one jet orifice, and having a fluid inlet and a fluid outlet for fluid flow into and out of said manifold comprising the steps of,
connecting a source of reduced pressure to said fluid outlet sufficient to prevent the flow of fluid from said at least one orifice,
continuously supplying said fluid under pressure from a source of fluid supply to a fluid supply return line while bypassing said fluid inlet and said fluid outlet of said print head, and
redirecting said fluid under pressure to said fluid inlet of said print head while disconnecting said fluid outlet from said source of reduced pressure and connecting said fluid outlet to said fluid supply return line, whereby a jet stream of fluid commences flow through said at least one orifice and fluid is continuously supplied through said manifold.

4,404,567
PRINTING HEAD DRIVE CIRCUIT FOR THERMAL PRINTER

Shigeru Katsuragi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,428
Claims priority, application Japan, Oct. 3, 1980, 55-138280
Int. Cl.³ G01D 15/10; H05B 3/00
U.S. Cl. 346—76 PH 6 Claims



1. In a thermal printing apparatus comprising thermal printing head means including a plurality of heat generating elements which are energized by a power supply and heat generating elements drive means for selectively driving the heat generating elements in accordance with input data to be recorded on a heat-sensitive paper sheet, the improvement wherein said heat generating element drive means comprises:
a plurality of switching circuits for selectively energizing the heat generating elements;
a reference voltage generating circuit for generating a reference voltage which is commonly applied to the heat generating elements; and
a constant voltage circuit connected between the power supply and the reference voltage generating circuit for maintaining the reference voltage constant.

4,404,568
PRINTER

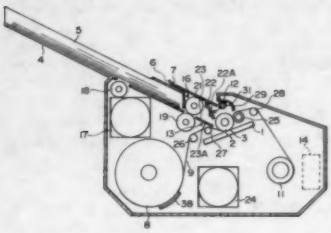
Yoshiki Kikuchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1981, Ser. No. 312,023
Claims priority, application Japan, Dec. 19, 1980, 55-178918
Int. Cl.³ G01D 15/10, 15/24; G03G 15/00
U.S. Cl. 346—76 PH 6 Claims

1. In a thermosensitive image recording device of the type wherein an ink donor sheet having heat sensitive ink on one surface thereof is selectively heated in accordance with picture information at a recording station to melt and transfer selected portions of said ink to a recording paper in contact with said one surface of said ink donor sheet, said recording device comprising:
a source of recording paper;
a first transport mechanism for transporting said recording paper from said source through a first path which passes through said recording station;

a source of ink donor sheet;

a second transport mechanism for transporting said ink donor sheet from said donor sheet source through a second path which passes through said recording station, said first and second paths being different from one another but coinciding in the same direction of movement at least at said recording station;



means for detecting said recording paper at a predetermined position in said first path prior to said recording station; and

control means for operating said first and second transport mechanisms in accordance with said detection.

4,404,569

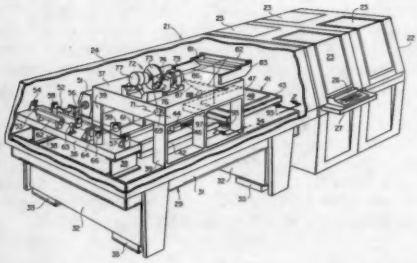
SYSTEM AND METHOD FOR PRODUCING ARTWORK FOR PRINTED CIRCUIT BOARDS

Don B. Neumann, Laguna Beach; Lyle K. Norton, Santa Ana, and Eric V. Olson, Long Beach, all of Calif., assignors to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 42,133, May 24, 1979. This application Mar. 19, 1981, Ser. No. 245,696

Int. Cl.³ G01D *9/42;* **H04N** *1/22;* **G03B** *41/00*

U.S. Cl. 346—108 **3 Claims**



1. In a system for use in the manufacture of printed circuit boards: means for providing a beam of coherent radiation, means for modulating the beam with data representative of artwork to be formed on the circuit boards, a carriage movable along an axis for supporting an output medium, means for directing the beam along a predetermined path toward the output medium and deflecting the beam to effect repeated scanning of the beam along successive scan lines across the output medium in a direction perpendicular to the axis of carriage movement, means for driving the carriage continuously at a predetermined speed along the axis during scanning of the output medium, an electrically controlled mirror disposed in the path of the beam for adjusting the position of the beam on the output medium in a direction parallel to the axis of carriage movement, means for applying a signal to the electrically controlled mirror for deflecting the beam along the axis as the scan progresses across the output medium to maintain a trace substantially perpendicular to the axis notwithstanding the movement of the carriage during each scan line.

4,404,570

LASER RECORDER

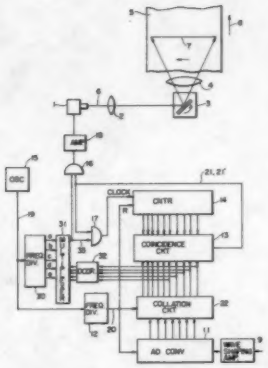
Masahiro Ohnishi; Yuji Ohara; Hiroshi Ono, and Shigenori Oosaka, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 3, 1981, Ser. No. 231,064

Claims priority, application Japan, Feb. 8, 1980, 55/14626

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—108 **9 Claims**



1. A laser recorder device comprising: means for producing sampled digital values of an input signal; means for providing a digital output signal in response to a predetermined function of said sampled digital values of said input signal; a beam source; means for scanning an output beam of said beam source upon a recording medium; pulse generating means for producing an output pulse signal having a frequency substantially higher than the frequency at which said input signal is sampled; and means for applying pulses of said pulse signal to said beam generating means with the number of pulses applied being determined in accordance with the value of said digital output signal.

4,404,571

MULTIBEAM RECORDING APPARATUS

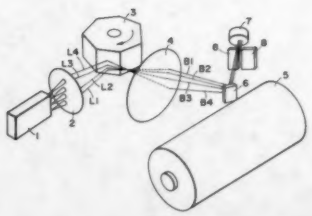
Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,058

Claims priority, application Japan, Oct. 14, 1980, 55-143447; Oct. 14, 1980, 55-143448

Int. Cl.³ G01D *9/42, 15/10*

U.S. Cl. 346—108 **18 Claims**



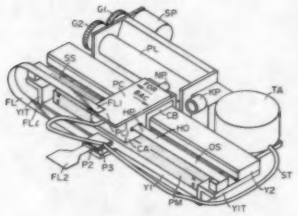
1. A beam recording apparatus using a plural number of beams, said apparatus comprising:

means for scanning a recording medium with said beams;
beam detection means for receiving said beams and producing detection signals in response to receipt of said beams;
a beam selection member, associated with said detection means, through which only one of said beams of said plural number of beams can pass at one time to be incident on said detection means;
means for distributing said detection signals; and
means for controlling the start of recording with said beams individually by means of said distributed detection signals.

4,404,572
RECORDING APPARATUS

Shigeru Okamura, Yokohama; Hiroshi Kyogoku, Kawasaki, and Shigemitsu Tazaki, Matsudo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1980, Ser. No. 114,202
Claims priority, application Japan, Jan. 31, 1979, 54/10181; Feb. 21, 1979, 54/19227
Int. Cl.³ G01D *15/16, 15/24*
U.S. Cl. 346—140 R **10 Claims**

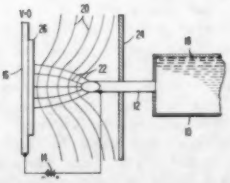


1. A recording apparatus comprising:
an elongated permanent magnet disposed perpendicular to a direction in which a recording paper is advanced;
a guide member of magnetic material disposed in parallel relation to said permanent magnet;
a carriage slidably movable along said guide member;
a coil mounted on said carriage and arranged to surround said guide member;
an ink nozzle mounted on said carriage;
a plate member of non-magnetic material having a plurality of slits, said plate member being surrounded by at least three internal faces of said carriage and being disposed in parallel with said permanent magnet; and
a light emitting and receiving element mounted on said carriage for detecting with the slits of said plate member each position of said carriage.

4,404,573
ELECTROSTATIC INK JET SYSTEM

Ray H. Kocot; Robert E. Rudd, III, both of Danbury, and Douglas R. Arnoldi, Southbury, all of Conn., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 28, 1981, Ser. No. 334,840
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **21 Claims**

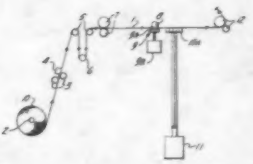


1. A low-head pressure, high flow, single filament ink jet system capable of delivering fluid to a particular point in a controlled manner comprising:
an ink reservoir containing conductive ink;
an ink jet nozzle of predetermined length conductively connected to said conductive ink;
a first conductive surface means;
a printing surface interposed between said first conductive surface means and said ink jet nozzle;
a second conductive surface means mounted on said ink jet nozzle; and
a potential source connected between said first conductive surface means and said ink jet nozzle, the application of said potential source creating an electrostatic field between said ink jet nozzle and said first conductive surface means, said second conductive surface means for reshaping the lines of force of said electrostatic field.

4,404,574
ELECTROGRAPHIC PRINTING SYSTEM USING DIELECTRIC FILM MEMBER

Herman Burwasser, Boonton, N.J., and John R. Wyhof, Latrobe, Pa., assignors to R.Q.O. Holding Company, Inc., Jamestown, N.Y.

Continuation-in-part of Ser. No. 17,131, Mar. 5, 1979, which is a continuation of Ser. No. 806,379, Jun. 14, 1977, abandoned, which is a division of Ser. No. 718,361, Aug. 27, 1976, Pat. No. 4,112,172, which is a continuation-in-part of Ser. No. 669,675, Mar. 23, 1976, abandoned. This application Nov. 28, 1980, Ser. No. 211,157
The portion of the term of this patent subsequent to Aug. 27, 1993, has been disclaimed.
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—153.1 **5 Claims**

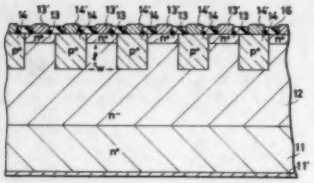


1. In an electrographic printing system wherein a latent image is electrographically transferred to a dielectric record member from an image-bearing electrode in close proximity to said member, which image may be subsequently rendered visible by application of a toner and permanently fixed into said member, the improvement which is characterized in that:
(a) said dielectric record member is a transparent dielectric film comprising:
(i) a transparent resin film base,
(ii) a transparent permanently conductive layer on said base, and
(iii) a transparent dielectric coating having a thickness of about 1.4–10 micrometers on said layer, and, wherein
(b) means are provided to transport said film record member at a controlled rapid rate across said electrode, thereby to provide clear, sharp, high contrast images on said film.

4,404,575
SEMICONDUCTOR DEVICE

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 96,649, Nov. 23, 1979. This application May 3, 1982, Ser. No. 374,301
Claims priority, application Japan, Jan. 22, 1979, 54-6356
Int. Cl.³ H01L 29/72, 29/80
U.S. Cl. 357—22 10 Claims



1. In a semiconductor device containing at least one static induction transistor, said transistor including a source semiconductor region and a drain semiconductor region both having a first conductivity type and a low resistivity, a channel region having said first conductivity type and a high resistivity and a gate region having a second conductivity type opposite to said first conductivity type and having a low resistivity;

said source and drain region being disposed to define a main current path therebetween through said channel region, said gate region being disposed to substantially control the potential of an intermediate semiconductor region in said current path, the improvement wherein:

said intermediate semiconductor region is interposed in said current path contacting said source region, gate region and channel region, and is of said first conductivity type, and a resistivity higher than that of said channel region;

and said transistor further includes:

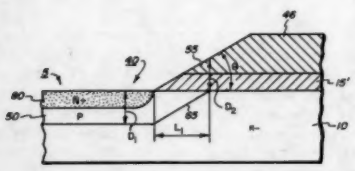
a first isolating insulator region disposed in contact with said gate region and disposed between said gate region and said drain region; and

a second insulator region disposed to isolate said souce region from said gate region.

4,404,576
ALL IMPLANTED MOS TRANSISTOR

Ram S. Ronen, Placentia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 9, 1980, Ser. No. 157,744
Int. Cl.³ H01L 29/78
U.S. Cl. 357—23 11 Claims



1. An all implanted MOS transistor having a DMOS-like structure formed in a substrate and having an implanted source area and an implanted drain area, comprising:

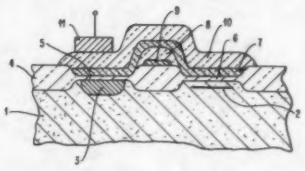
(a) a dielectric layer formed to a predetermined thickness on the surface of the substrate between the implanted source and drain areas, said dielectric layer having an edge adjacent to the source area which is beveled to a predetermined gradient with respect to said surface of said substrate; and

(b) channel area means in said substrate extending from an edge of said source area toward said drain area, said channel area being disposed relatively beneath at least the thinner portions of said beveled edge of said dielectric layer, said channel area having a fixed length measured along said surface of said substrate from said edge of said source area which is relatively proportional to the predetermined gradient of the beveled edge of said dielectric layer.

4,404,577
ELECTRICALLY ALTERABLE READ ONLY MEMORY CELL

Hayden C. Cranford, Jr., Apex; Charles R. Hoffman, Raleigh, and Geoffrey B. Stephens, Cary, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,470
Int. Cl.³ H01L 29/78, 27/02
U.S. Cl. 357—23 3 Claims



2. An electrically programmable and erasable MOS memory cell structure, comprising:

a silicon substrate having a source, a drain and a conductive channel means connecting said source and drain;

a diffused control gate region of semiconductive material separate from said conductive channel and located in the surface of said substrate; and

means for connecting a source of electrical potential to said source, said drain and said diffused control gate region;

a single crystal silicon oxide insulator layer overlying said diffused control gate region, said channel region and said substrate, said oxide insulator layer being thinner in the vertical direction over said diffused region and over said channel region than over other portions of said substrate;

an electrically floating conductive gate means deposited on the surface of said single crystal silicon oxide insulator layer in a zone overlying at least a portion of both said diffused control gate region and said conductive channel region;

a conductive programming gate means overlying said single crystal silicon oxide insulator and underlying said floating gate means in a region laterally between said control gate diffusion area and overlying at least a portion of said channel area in the surface of said oxide insulation;

a layer of polycrystalline silicon oxide insulating said programming gate from said floating gate and being provided with an electrical contact for connecting a source of electrical potential thereto; and

a conductive erase gate means overlying said insulating layer of polycrystalline oxide in a region generally overlying said diffused control gate region in said substrate beneath, said conductive erase gate means being supplied with an electrical contact for applying an erase voltage across said polycrystalline oxide to said floating gate means by capacitive coupling through said oxide insulator layers;

said single crystal silicon oxide and said polycrystalline silicon oxide are in the areas which overly said diffused control gate and said conductive channel, respectively of thicknesses related to one another by approximately the

ratio of one to four, said single crystal oxide thickness being represented by the numerator.

4,404,578

STRUCTURE OF THIN FILM TRANSISTORS

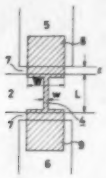
Yutaka Takafuji; Keisaku Nonomura, both of Nara; Sadatoshi Takechi, Tenri; Hisashi Uede, Wakayama, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1980, Ser. No. 173,818

Claims priority, application Japan, Jul. 31, 1979, 54-98368; Jul. 31, 1979, 54-98370; Aug. 9, 1979, 54-101912

Int. Cl.³ H01L *29/78, 27/02*

U.S. Cl. 357—23 **10 Claims**



1. A thin film transistor for use in a display device comprising a support substrate having mounted thereon thin film transistor components comprising a gate electrode interpositioned between a drain electrode and a source electrode with an insulative layer overlying said gate electrode such that neither of said gate electrode nor the insulative layer overlying said gate electrode overlap either of said drain electrode or said source electrode relative to said substrate, said thin film transistor further including a semiconductor layer superimposed over each of said source electrode, said insulative layer overlying said gate electrode, and said drain electrode, said semiconductor layer further comprising a semiconductor channel portion which extends from the edge of said source electrode to the edge of said drain electrode across said gate electrode, a portion of said semiconductor channel being substantially narrower than the width of said semiconductor layer portion in contact with said drain and source electrodes such that the ratio of the narrow portion of said semiconductor channel to the width of the gate electrode is in the order of from several tenths to several hundredths, and at least one display element electrode as a material identical to that of at least one of said gate electrode, source electrode and drain electrode, said thin film transistor for switching display signals to be applied to said at least one display element electrode.

4,404,579

SEMICONDUCTOR DEVICE HAVING REDUCED CAPACITANCE AND METHOD OF FABRICATION THEREOF

Horst Leuschner, Austin, Tex., assignor to Inc. Motorola, Schaumburg, Ill.

Filed Oct. 28, 1980, Ser. No. 201,102

Int. Cl.³ H01L *29/78, 29/04, 29/34*

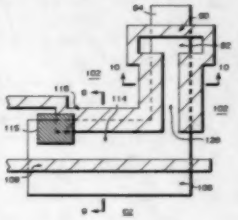
U.S. Cl. 357—23 **4 Claims**

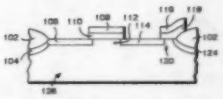
1. An inverter formed on a substrate of semiconductor material of a first conductivity type, said substrate having a field which defines the periphery of an active region and having a channel stop region of the first conductivity type but of a higher concentration of dopant than the substrate, said channel stop region being underneath the field, said inverter comprising:

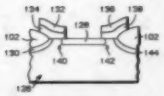
a first transistor having a source region doped to a second conductivity type, a channel region of the first conductivity type, and a drain region doped to the second conductivity type, formed in the active region, said drain region coupled to a first power supply terminal;

a second transistor having a source region doped to the second conductivity type, a drain region doped to the second conductivity type, and a channel region of the first conductivity type formed in the active region, said source coupled to a second power supply terminal wherein the source region of the first transistor is formed in common with the drain region of the second transistor to form an output of the inverter;

a first line on the surface of the substrate a first portion of which overlaps a portion of the active region and the field, a second portion of which overlies the channel region of the first transistor to form a gate thereof, said line comprising a lower insulating layer, and an upper electrically conductive layer, said upper electrically conductive layer







being physically continuous between said first and second portions and electrically connected to the drain region of the first transistor;

a spacer region of the first conductivity type and of substantially the same doping concentration as the substrate formed in the active region between the channel stop region and the source and drain regions of the first and second transistors, respectively, and underneath the first portion of the first line; and

a second line on the surface of the substrate comprising a lower insulating layer and an upper electrically conductive layer and overlying the channel region of the second transistor to form an input of the inverter.

4,404,580

LIGHT ACTIVATED SEMICONDUCTOR DEVICE

Nobutake Konishi; Masayoshi Naito; Tsutomu Yatsuo, and Yoshio Terasawa, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1980, Ser. No. 172,072

Claims priority, application Japan, Aug. 1, 1979, 54-97339

Int. Cl.³ H01L *29/74, 29/14, 29/12*

U.S. Cl. 357—38 **11 Claims**

1. In a light activated semiconductor device comprising:

(1) first and second semiconductor devices disposed in a semiconductor body having first and second major surfaces; each said device having four impurity regions formed as adjoining layers in said body between said

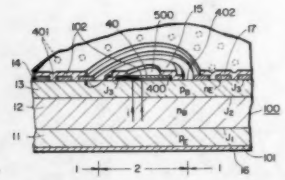
major surfaces, with adjacent impurity regions being of alternate carrier types to form PN junctions between said adjacent regions so that for each device an impurity region adjoining said first major surface forms a first emitter, an impurity region adjoining said second major surface forms a second emitter and the two impurity regions between said first and second emitters form first and second base regions with the first base region adjoining the first emitter and the second base region adjoining the second emitter, respectively;

(2) said second base, first base and first emitter regions of said first and second devices being common to both devices;

(3) said common second base region adjoining portions of said second major surface of said first device, and said second emitter regions of said first and second devices being spaced from each other;

(4) wherein an exposed portion of said second major surface, adjoining said second emitter region of said second device, activates said second device when electromagnetic radiation of wavelengths corresponding substantially to a bandgap energy of a semiconductor material of said body strikes said exposed portion of said second major surface;

(5) cathode and anode electrodes disposed on portions of said second and first major surfaces, respectively, of said semiconductor body to make ohmic contact with said



second emitter region of said first device and a common first emitter region of both devices;

(6) a floating contact positioned on a portion of said second major surface to make ohmic contact with said common second base region between said devices and said second emitter region of said second device, while leaving exposed for light activation said exposed portion of said second major surface adjoining said second emitter region of said second device; the improvement further comprising:

(a) said second emitter of said second device comprising first and second portions, said first portion abutting said second base region so that a p-n junction is formed therebetween,

(b) said first base region having an impurity density lower than that of said first emitter region, said second base region having an impurity density higher than that of said first base region, said first portion of said second emitter of said second device having an impurity density lower than a maximum value of an impurity density of said second base region, and said second portion of said second emitter region of said second device having an impurity density higher than said first portion, and

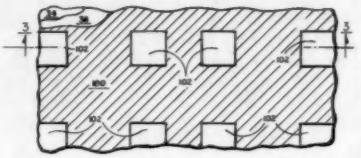
(c) a maximum value of said impurity density of said second base region being at least 10 times greater than the impurity density of said first portion.

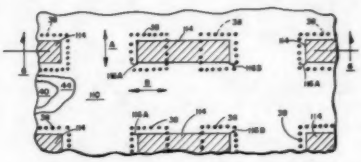
4,404,581

ROM WITH REDUNDANT ROM CELLS EMPLOYING A HIGHLY RESISTIVE POLYSILICON FILM FOR PROGRAMMING THE CELLS

Matthias L. Tam, Monterey Park, and Frank Z. Custode, Norco, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 15, 1980, Ser. No. 216,578
Int. Cl.³ H01L *29/04, 29/12, 29/78, 27/02*
U.S. Cl. 357—59 **5 Claims**





1. A VLSI ROM with provision for redundancy comprising, in combination:

a plurality of ROM cells each comprising a transistor;

a plurality of surplus cells each having a transistor in series with a high resistance polysilicon resistor; and,

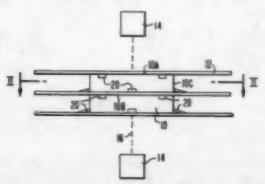
means for selecting a surplus cell to replace one of said ROM cells, said surplus cell being irreversibly programmable to conductive logic state by the application of programming bias voltage across its transistor and associated resistor to establish a highly conductive condition for the resistor, and being representative of the non conductive logic state with the resistor intact at high resistance due to the absence of any application of programming bias voltage.

4,404,582

MOUNTING ARRANGEMENT FOR DISC MOUNTED SEMICONDUCTOR DEVICES

David D. Pollard, Amanda, and Gary E. Krajci, American, both of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 28, 1980, Ser. No. 211,170
Int. Cl.³ H01L *23/42*
U.S. Cl. 357—79 **2 Claims**



1. A semiconductor device assembly comprising:

a stack including a plurality of disc type semiconductor

devices in axial alignment and a plurality of metal sheets, serving as both heat sinks and electrical conductors, of which one is located at each major face of each of said devices including at least one metal sheet that is directly between two of said devices;

each of said metal sheets having a plurality of holding fingers stamped from the material thereof and deformed to grip the edge of the adjacent device, with said at least one metal sheet that is directly between two devices having holding fingers stamped and deformed away from both of the surfaces of said sheet; and,

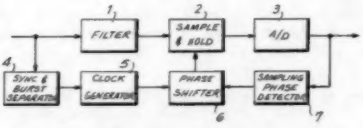
means for applying a predetermined pressure along the axis of said devices.

4,404,583

METHOD AND APPARATUS FOR DETERMINING AND CONTROLLING THE SAMPLING PHASE IN SAMPLING THE BURST SIGNAL OF A COLOR TELEVISION SIGNAL

Mitsushige Tatami, Ebina, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,895
Claims priority, application Japan, Jul. 2, 1980, 55-90179
Int. Cl.³ H04N 9/46
U.S. Cl. 358—13 **36 Claims**



1. In a system for digitizing a color television signal wherein the color television signal is sampled with a sampling signal whose rate is a multiple of the burst signal frequency and each sample is converted to a corresponding digital signal, a method for controlling the phase of the sampling signal comprising the steps of obtaining at least three samples of the burst signal included in said color television signal; determining a reference sampling phase as a function of at least two of said samples by deriving a calculated sample level from said at least two samples; sensing a phase error between the actual sampling phase of said sampling signal and said reference sampling phase by detecting the difference between said calculated sample level and the level of a predetermined one of said at least three samples; and adjusting the phase of said sampling signal in accordance with said detected difference in a direction to reduce said detected difference to a null value.

4,404,584

SIGNAL PROCESSING APPARATUS EFFECTING ASYMMETRICAL VERTICAL PEAKING

Dalton H. Pritchard, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 38,283, May 11, 1979, abandoned. This application Nov. 23, 1982, Ser. No. 443,926
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 **6 Claims**

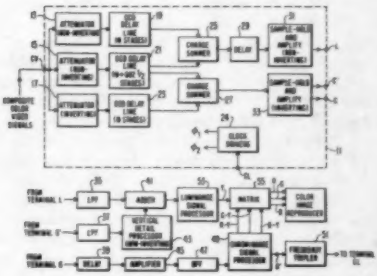
1. In a color television receiver subject to reception of input composite color video signals having a given line frequency, and inclusive of a luminance component, and a chrominance component sharing a portion of the band of frequencies occupied by said luminance component; signal processing apparatus comprising:

first, second and third clocked delay lines, each having an input and an output, with the inputs of said first and second clocked delay lines receiving a first version of said input composite color video signals and the input of said third clocked delay line receiving a second version of said input composite color video signals which is phase inverted relative to said first version thereof; the signal delay provided by said second clocked delay line exceeding each of the respective signal delays provided by said first and third clocked delay lines by a line interval;

first comb filter means for subjecting said input composite color video signals to a first frequency response characteristic exhibiting regularly spaced rejection notches recurring at odd multiples of half said line frequency, said first comb filter means comprising means for summing the output of said first clocked delay line with only the output of said second clocked delay line;

second comb filter means for subjecting said input composite color video signals to a second frequency response characteristic exhibiting regularly spaced rejection notches recurring at even multiples of half said line frequency, said second comb filter means comprising means for summing the output of said second clocked delay line with only the output of said third clocked delay line;

means for effecting asymmetrical vertical peaking of said luminance component in such manner that a transition-enhancing overtravel in the white direction is associated



only with a transition in the direction of vertical scanning of a black-to-white type and transition-enhancing overtravel in the black direction is associated only with a transition in the direction of vertical scanning of a white-to-black type, said asymmetrical vertical peaking means comprising:

(a) a signal adder;

(b) a first signal path, coupled between the output of said first-named summing means and an input of said signal adder, for translating the output of said first comb filter means with a first gain; and

(c) a second signal path, coupled between the output of said second-named summing means and an input of said adder, and including a low pass filter restricting signal passage to a band of frequencies substantially exclusive of said band portion occupied by said chrominance component, for translating at least a portion of the signal output of said second comb filter means with a second gain greater than said first gain; and

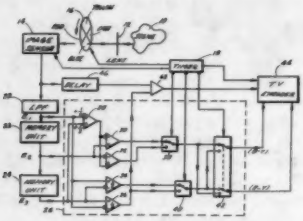
means for utilizing the output of said adder to control the luminance of displayed color images;

wherein one of said signal paths, to the exclusion of the other, effects its signal translation with a net polarity inversion.

4,404,585
VIDEO SEQUENTIAL COLOR SYSTEM

Bernhard A. Hjortzberg, 1320 Carmelita, Laguna Beach, Calif. 92691

Filed Oct. 8, 1981, Ser. No. 309,721
Int. Cl.³ H04N 9/04
U.S. Cl. 358—41 12 Claims

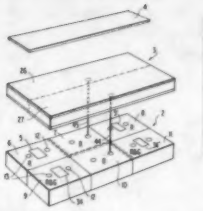


1. A video sequential color processing system comprising:
an image sensing device for sequentially receiving visual information and providing electrical read-out signals corresponding to the full resolution luminance and chroma information of each scan;
means for sequentially coloring the visual information received by said image sensing device, with a specific color during each scan of said image sensing device, so that the read-out signals are in sequential color flow relationship;
said sequential coloring means arranged in sets of complementary colors, so that a specific color is followed two scans later by the complement of the specific color;
means for separating low resolution luminance and chroma signals from the full resolution read-out signals;
a first memory unit for storing the low resolution signals from said separating means, and having an output corresponding in time to a field scan which is one field scan later than the output of said separating means;
a second memory unit for storing the low resolution signals received from said first memory unit, and having an output corresponding in time to a field scan which is one field scan later than the output of said first memory unit, and two field scans later than the output of said separating means;
a summing amplifier for receiving signals from said separating means, and from said second memory unit, resulting in an output of low resolution luminance;
a first pair of differential amplifiers, each receiving signals from said first memory unit, and signals from said summing amplifier, at opposite terminals, resulting in outputs of sequential chroma signals from each of said first pair of amplifiers;
a second pair of differential amplifiers, each receiving signals from said second memory unit, and signals from said separating means, at opposite terminals, resulting in outputs of sequential chroma signals from each of said second pair of amplifiers;
a timer means for synchronizing said sequential coloring means and said image sensing device;
a switching means which is controlled by said timer means and which selects the positive chroma signals from each of said first pair and each of said second pair of amplifiers into outputs of continuous low resolution primary chroma signals;
means for processing the full resolution read-out signals by canceling the chroma information signals, resulting in an output of full resolution luminance signal; and
a television encoder which receives the full resolution luminance signal and the low resolution chroma signals, and encodes the signals into standard broadcast color format.

4,404,586
SOLID-STATE COLOR IMAGER WITH STRIPE OR MOSAIC FILTERS

Masatoshi Tabei, Sunnyvale, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 15, 1981, Ser. No. 330,927
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 9 Claims



1. A solid-state color imager, comprising:
a semiconductor switching matrix comprising a matrix of charge switching elements and a group of photodiodes, each photodiode being associated with one charge switching element, respectively, a first group of said charge switching elements being unassociated with any photodiodes, each said charge switching element alone or with an associated photodiode comprising a pixel of said semiconductor switching matrix;
a plurality of photoconductor segments overlying at least a portion of said semiconductor switching matrix, said segments being electrically connected respectively to charge switching elements unassociated with photodiodes, whereby the intensity of light sensed by any said segment is transferred to the electrically connected charge switching element as an electrical signal representing light intensity;
a mono color filter overlying a portion of said photoconductor segments and a portion of said semiconductor switching matrix;
said mono color filter, said photoconductor segments and said switching matrix being positioned relative to one another so that said pixels with photodiodes receive and convert into electrical signals light which impinges thereon after passing through one, both or neither of said filter and photoconductor segments, and said pixels without photodiodes receive electrical signals from photoconductor segments which convert light impinging thereon directly or via said filter.

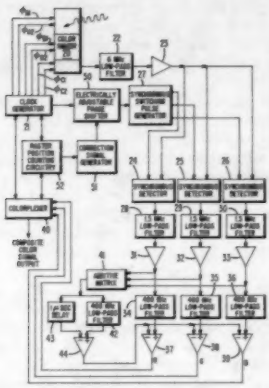
4,404,587
ELECTRICAL COMPENSATION FOR MISREGISTRATION OF STRIPED COLOR FILTER IN A COLOR IMAGER WITH DISCRETE SAMPLING ELEMENTS

Peter A. Levine, West Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,594
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 6 Claims

1. A color television camera comprising:
an imager having discrete sensing elements arrayed in columns and rows;
a color stripe filter interposed in the optical path to said imager, so its stripes project to respective columns of sensing elements;
means for deriving from said imager discrete samples of the respective colors of the information imaged on the imager, which samples are subject to errors owing to misregistra-

tion of the projected stripes and the columns of sensing elements; and



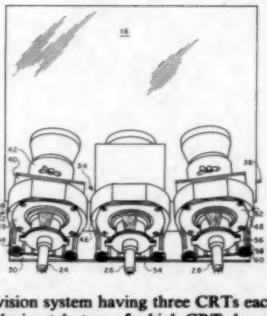
means for re-sampling said discrete samples to obtain further color samples with reduced hue error.

4,404,588

CRT HOLDING ASSEMBLY FOR PROJECTION TELEVISION

Michael A. Fanizza, Mt. Prospect, and Richard G. Schmid, Glenview, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 5, 1981, Ser. No. 318,309
Int. Cl.³ H04N *5/655, 5/74*
U.S. Cl. 358—60 **9 Claims**



1. In a television system having three CRTs each including an integral indexing tab, two of which CRTs have tilted faceplates, each of which faceplates is tilted opposite to the other, and wherein the image generated by each of said CRTs is projected through an associated lens onto a viewing screen, an assembly for holding said CRTs in proper optical alignment, comprising:

a platform;

three pods adapted to be mounted on the platform,

each of said pods comprising:

a generally cylindrical, hollow, one piece, non-conductive housing defining a generally circular rear opening for receiving the front piece of a CRT and defining a front opening through which the CRT's image projects and,

including indexing means engageable with the indexing tab of said received CRT for holding that CRT at a preselected rotational position;

said housing further including means for supporting said associated lens in a selected optical alignment relative to the faceplate of said received CRT;

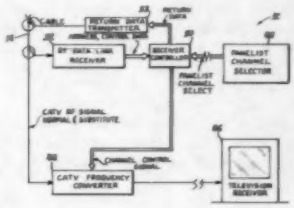
a cover having a central aperture therein sized to fit over a CRT neck, said cover being adapted to engage the funnel portion of the CRT and to mate with the rear opening of said housing so that the screen of said received CRT is substantially flush with the front opening of said housing.

4,404,589

CABLE TELEVISION WITH MULTI-EVENT SIGNAL SUBSTITUTION

W. Andrew Wright, Jr., Bethlehem, Pa., assignor to IRI, Inc., Chicago, Ill.

Filed Oct. 21, 1980, Ser. No. 199,258
Int. Cl.³ H04N *1/00*
U.S. Cl. 358—86 **8 Claims**



1. In a cable television system having head end means at a head end station, transmission cable, and a plurality of receiving means at respective panelist receiving stations, said head end means including means for applying normal television program signals in normal television channels to said transmission cable, and each of said receiving means including panelist channel selector means under control of a viewer for selecting a normal channel for viewing of a respective normal television program, said panelist channel selector means producing a panelist channel select signal indicative of said television channel, a television receiver, and a cable television frequency converter for receiving television program signals from said transmission cable and responsive to a channel select signal for selectively converting received television program signals in the respective television channel to converted television program signals acceptable to said television receiver and applying the respective converted television program signals to said television receiver:

a targetable signal substitution system comprising means at said head end station for applying substitute television program signals in at least one substitute channel to said transmission cable, and means at said head end station for applying signal substitution control signals to said transmission cable, said signal substitution control signals including a plurality of different terminal command signals and a plurality of different event command signals, each of said terminal command signals including a respective panelist address signal for identifying a respective panelist receiving station and a plurality of event identification signals identifying respective ones of a plurality of events, and each of said event command signals including a respective event address signal corresponding to a respective event and a normal channel identification signal for identifying a normal channel into which a substitute television program is to be switched; and

control means at each panelist receiving station responsive to said signal substitution control signals for selectively switching a substitute television program into a normal channel, said control means including means for generating a local panelist address signal, means for generating a plurality of local event address signals with each of said

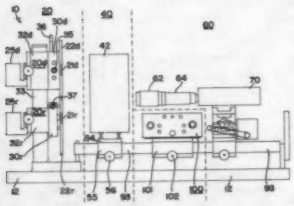
local event address signals corresponding to a local event address signal at each of the other panelist receiving stations, substitute channel selector means for producing a substitute channel select signal corresponding to a substitute channel, first comparison means for comparing the received panelist address signal of each terminal command signal with said local panelist address signal and producing a first match signal when said compared panelist address signals match, means responsive to said first match signal for storing event signals corresponding to said event identification signals of the respective terminal command signal, second comparison means for comparing a received event address signal with each of said local event address signals and producing a second match signal when said compared event address signals match, third comparison means responsive to said second match signal for comparing said received normal channel identification signal with said panelist channel select signal and producing a third match signal when said compared channel identification and channel select signals match, and means responsive to said stored event signals and said third match signal for switching a substitute channel select signal to said cable television frequency converter in lieu of the channel select signal selected by the viewer for a period determined by said event command signals, whereby for said period said television receiver receives the program in the corresponding substitute channel in lieu of the program of the channel to which the normal channel selector is set.

4,404,590

VIDEO BLINK COMPARATOR

Ben Mayer, Los Angeles, Calif., and Catherine A. Phillips, Manset, Me., assignors to The Jackson Laboratory, Bar Harbor, Me.

Filed Aug. 6, 1981, Ser. No. 290,569
Int. Cl.³ H04N 7/18
U.S. Cl. 358—106 **64 Claims**



1. A video blink comparator comprising:

data image presentation means including a first image carrier, first light source, and first lens means for establishing a data image light path;

reference image presentation means including a second image carrier, second light source, and second lens means for establishing a reference image light path;

optical means for superimposing said data image light path and reference image light path;

image forming lens means positioned in the superimposed data image and reference image light paths for forming a superimposed data image and reference image in a common focal plane spaced from said image forming lens means;

said data image and reference image being the same positive or negative image mode;

at least one of said image carriers operatively mounted for translation and at least one of said image carriers operatively mounted for rotation for accurate alignment and superimposition of the respective data image and reference image formed by the image forming lens means in said focal plane;

video camera means and camera mounting means for translating said camera along three dimensions or axes for positioning the video camera scanning surface in said focal plane for scanning of at least a selected portion of the image field of the superimposed data image and reference image and forming a video signal of said superimposed images;

extension means for coupling said image forming lens means and video camera means at desired spaced apart positions relative to each other;

blink control means for independently controlling said respective first and the second light sources for operation of said light sources at the same selected blink frequencies, but offset in phase so that when one light source is on the other is off whereby the data image and reference image are operatively superimposed in the same image field of the focal plane alternately and sequentially in time rather than simultaneously;

and video presentation means for integrating and summing the superimposed data image and reference image in time to provide a constant background from the common elements in the data image and reference image with blinking of variant portions of the data image and reference image against the constant background at said selected blink frequency;

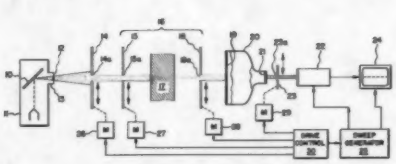
said video blink comparator thereby affording direct viewing of the alternately and sequentially superimposed data image and reference image for direct recognition by a viewer or operator on the video presentation means of variant portions blinking on the constant background.

4,404,591

SLIT RADIOGRAPHY

David C. Bonar, Shelton, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 337,031
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 **16 Claims**



1. In a radiography system which includes:

source means which function to direct X-ray radiation through an examination area;

an X-ray image intensifier having an input screen which is disposed to receive radiation from the source means which has passed through the examination area and an output screen for producing an intensifed visible image which corresponds to radiation impinging on the input screen;

television pickup means disposed to view the output screen which function to produce a television signal corresponding to an image thereon; and

first scanning means which define and move a first X-ray collimator slit disposed between the source means and the examination area and which functions to limit direct radiation from the source means to a limited portion of the input screen;

the improvement comprising second scanning means which function, in synchronism with the motion of the first collimator slit, to limit the view of the television pickup means to a limited area of the output screen on which the image corresponds to radiation on the limited area of the

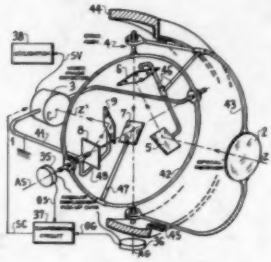
input screen which receives direct radiation from the source means through the first slit.

4,404,592

VIDEO IMAGERY DEVICE, ESPECIALLY FOR A HOMING UNIT

Christian Pepin, and Patrick Herlin, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Oct. 19, 1981, Ser. No. 312,917
Claims priority, application France, Oct. 21, 1980, 80 22458
Int. Cl.³ H04H 5/34
U.S. Cl. 358—125 **14 Claims**



1. A video imagery device comprising a support means for a unit constituted by a receiving optical element for focusing the radiation on an image detector rigidly fixed to a support means, a gyroscopic assembly having two degress of freedom for stabilizing the receiving optic axis, said assembly being constituted by a gimbal suspension provided with two mechanical axes of rotation which pass through its center in order to produce angular displacements in elevation and in azimuth and to cause spatial rotation of the optic axis relatively to a reference axis associated with the support means and terminating at the detector, an optical deviating means for bringing the direction of the optic axis into a position corresponding to the reference axis, said gimbal suspension and said optical deviating means being so determined that the optical deviation path passes through a first mechanical axis of rotation aforesaid and then passes through the second mechanical axis of rotation via the center of the gimbal suspension.

4,404,593

BRIGHTNESS CONTROL CIRCUIT

Robert L. Shanley, II, Indianapolis, Ind., and Leopold A. Harwood, Bridgewater, N.J., assignors to RCA Corporation, New York, N.Y.

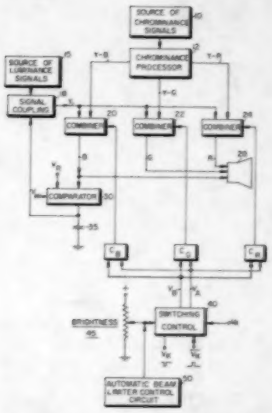
Filed Aug. 27, 1981, Ser. No. 296,863
Int. Cl.³ H04N 5/14
U.S. Cl. 358—168 **2 Claims**

1. In a color television receiver system including a video signal transmission path for processing a color image representative video signal, said transmission path including a chrominance channel for processing a chrominance component of said video signal, and a luminance channel for processing a luminance component of said video signal having periodically recurring image intervals and image blanking intervals between adjacent image intervals and comparing a reference interval containing a black reference level; means for combining signals processed by said luminance and chrominance channels; and means for supplying output signals from said combining means to an image reproducing device; apparatus comprising:

clamping means, including charge storage means, responsive to an output signal from said combining means for maintaining a desired condition of said black reference level, said clamping means being operative during said reference intervals and inoperative during said image intervals;

a source of variable brightness control voltage; and

means for selectively coupling said brightness control voltage to said video signal transmission path during said image intervals for varying the DC level of said video signal to thereby vary the brightness of a reproduced image, and for decoupling said brightness control voltage from said signal transmission path during said black level reference intervals to prevent said clamping means from responding to said variable brightness control voltage; wherein



said combining means comprises a matrix amplifier responsive to said luminance and chrominance components for developing an output color image representative signal across a load impedance;

said brightness control voltage is selectively coupled to said load impedance during said image intervals independent of the signal gain of said matrix amplifier, and decoupled from said load impedance during said black level reference intervals; and

said clamping means is coupled to said load impedance for sensing the condition of said black reference level.

4,404,594

IMAGING SYSTEM WITH ENLARGED DEPTH OF FIELD

William J. Hannan, Concord, Mass., assignor to Itek Corporation, Lexington, Mass.

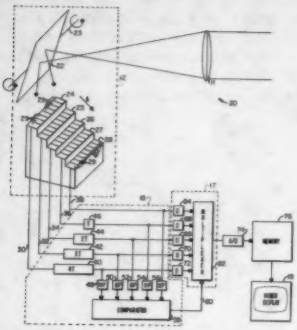
Filed Nov. 2, 1981, Ser. No. 317,363
Int. Cl.³ H04N 5/30, 3/08, 3/14
U.S. Cl. 358—209 **20 Claims**

1. An imaging system with an enlarged depth of field for use with a means for focusing an image, said imaging system comprising:

means for sensing an image sample from each of a plurality of portions of said image at each of a plurality of optical distances from said means for focusing, said means for sensing including means for scanning said image in a first direction, and a plurality of sensor means extending generally transverse to said first direction for sensing a line of image samples of said image at said plurality of optical distances;

means for determining the relative focus of the image sam-

ples derived from a portion of said image at each of said plurality of optical distances; and



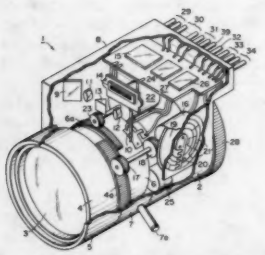
means, responsive to said means for determining, for choosing, for each of said plurality of portions of said image, the image sample having a desired focus.

4,404,595

LENS UNIT FOR A CAMERA

Tatsuzo Ushiro, Tokyo, and Hiroyuki Takimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,635
Claims priority, application Japan, Jan. 15, 1980, 55-2861[U]
Int. Cl.³ H04N *9/10*
U.S. Cl. 358—227 **37 Claims**



1. A lens assembly for use with a camera body having electrical power supply circuit means, measured light signal providing means and zooming control means, said lens assembly comprising:

(A) a focus adjustable zoom lens system for image pick-up;

(B) an automatic focusing device for automatically adjusting the focus of said lens system onto an object;

(C) an automatic diaphragm device for automatically adjusting a diaphragm aperture in accordance with the measured light signal provided by said light signal providing means;

(D) an automatic zooming device for driving, under the control of said zooming control means, said lens system to effect zooming;

(E) means for connecting said automatic focusing device to said electric power supply circuit means;

(F) means for connecting said automatic diaphragm device to said measured light signal providing means; and

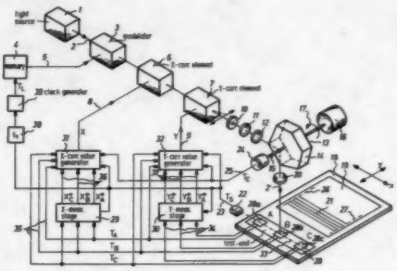
(G) means for connecting said automatic zooming device to said zooming control means.

4,404,596

METHOD AND APPARATUS FOR THE CORRECTION OF THE POSITION ERROR OF A MULTIFACETED ROTATING MIRROR

Heinrich Juergensen, Raisdorf, and Thomas Zelenka, Kiel, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,526
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046584
Int. Cl.³ H04N *1/04*
U.S. Cl. 358—293 **23 Claims**



1. A method for the correction of position errors of a light beam generated by light beam generating means and deflected point-wise and line-wise across a scanning surface by deflection means of said light beam generating means, said deflection means having at least one mirror surface, said scanning surface moving transversally to the deflection or line direction of the light beam relative to the deflection means, comprising the steps of:

before the actual reading or recording operation measuring a plurality of position errors of the light beam for each mirror surface in the deflection direction (X-direction) as X-position errors and at right angles thereto (Y-direction) as Y-position errors at points oriented in the line direction in the area of the scanning surface;

generating X-position and Y-position correction values for the position errors for each mirror surface;

altering the light beam incidence by applying the correction values to the light beam generating means while simultaneously measuring the actual position errors;

rechecking the actual position errors and altering the correction values until the actual position errors are compensated by specific correction values;

storing said specific correction values; and during actual operation applying said stored specific correction values to the light beam generating means synchronously with the movement of said deflection means.

4,404,597

TWO DIMENSIONAL RADIOMETRIC COMPENSATION FOR SCANNING APPARATUS

James C. Stoffel, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 2, 1981, Ser. No. 326,724
Int. Cl.³ H04N *1/10, 1/40*
U.S. Cl. 358—293 **2 Claims**

1. In a scanning apparatus having at least one array for scanning a document original line by line along a first axis, a platen for supporting said document original for scanning by said array, at least two independent scanning beams, each of said beams illuminating a line-like portion of said platen and the document original thereon, and means for sweeping each of said beams across at least a portion of said platen along a second axis substantially perpendicular to said first axis, said

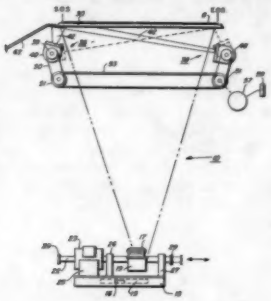
beams cooperating to progressively illuminate said platen and the document original thereon, the improvement comprising:

(a) first scanning beam generating means adjacent one end of said platen;

(b) second scanning beam generating means adjacent the opposite end of said platen;

(c) means for sweeping each of said beams output by said first and second scanning beam generating means across the entire length of said platen from said one end to said opposite end;

(d) means for correcting for deviations in the illumination intensities of said beams along both said first and second axes due to apparatus deficiencies and to overlapping of said beams including memory means for storing signals for compensating for illumination deviations along both said first and second axes, means for addressing said memory means in synchronism with scanning by said array and sweeping of said beams to provide a corrective signal, and



means to modify image signals output by said array in accordance with said corrective signal; said memory means including

(1) a first memory for storing signals for compensating for illumination deviations of said scanning beams along said first axis;

(2) a second memory for storing signals for compensating for illumination deviations of said scanning beams along said second axis;

(3) first digital to analog converter means for converting the signal output of said first memory to an analog signal;

(4) second digital to analog converter means for converting the signal output of said second memory to an analog signal; and

(5) means for combining the signal output of said first converter means with the signal output of said second converter means to provide said corrective signal.

4,404,598

COPYING AND ENGRAVING APPARATUS

Henry G. Sculli, 98-618C Kaonohi St., Aiea, Hi. 96701

Filed Jan. 9, 1981, Ser. No. 223,545

Int. Cl.³ H04N *1/22*

U.S. Cl. 358—296 **24 Claims**

1. A copying apparatus comprising

a base,

a first mounting means for mounting an article which is a subject of a copying process,

a second mounting means for mounting an object to be changed by the copying process,

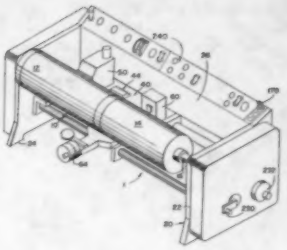
mounting fixing means for relatively fixing the first and second mounting means,

scanning means mounted adjacent the first mounting means for scanning the article,

changing means mounted adjacent the second mounting means for changing the object,

adjusting means connected to the scanning and changing means for adjusting relative longitudinal and transverse positions of the scanning and changing means,

moving means mounted on the base for moving the first and second mounting means with respect to the scanning and changing means,



stepping means mounted on the base for stepping the scanning and changing means with respect to the first and second mounting means,

elongated guide means mounted on the base and a carriage mounted on the base for moving along the guide means and wherein the scanning means and changing means and adjusting means are mounted on the carriage, and wherein the stepping means is connected to the carriage means and to the base for stepping the carriage means along the guide means.

4,404,599

LASER RECORDING INFORMATION AND PILOT SIGNALS FOR TRACKING ON A GROOVELESS RECORDING

Hisao Kinjo, and Keiji Ozawa, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

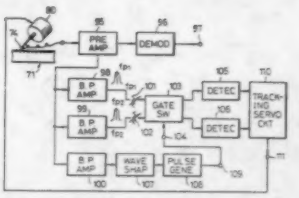
Division of Ser. No. 33,324, Apr. 25, 1979, Pat. No. 4,315,283, which is a continuation-in-part of Ser. No. 785,095, Apr. 6, 1977, Pat. No. 4,331,976. This application Jul. 8, 1981, Ser. No. 281,470

Claims priority, application Japan, Apr. 8, 1976, 51-38809; Oct. 26, 1976, 51-127767

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **3 Claims**



1. A recording disc having: information signal tracks having an information signal recorded thereon; and reference signal tracks having reference signals recorded thereon,

each of said reference signal tracks being formed on an intermediate part of said recording disc located between center lines of adjacent information signal tracks,

first and second reference signals having different frequencies alternately recorded on each of said reference signal tracks responsive to each rotation of the recording disc,

a third reference signal having a frequency which is different from the frequencies of the first and second reference signals, said third reference signal being recorded at predetermined positions on the information signal tracks responsive to each rotation of the recording disc.

4,404,600

GHOST SIGNAL CANCELLING APPARATUS

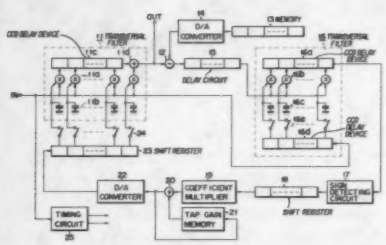
Junzo Murakami, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 12,485, Feb. 15, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 412,874

Claims priority, application Japan, Feb. 16, 1978, 53-16825

Int. Cl.³ H04N *5/21*; H04B *1/10*

U.S. Cl. 358—905 **16 Claims**



1. A ghost signal cancelling apparatus comprising means for applying an input video signal to a filter circuit including a first tranversal filter having a first set of weighting circuits for applying a first weighting signal to said filter circuit, means for supplying an output signal from the filter circuit to a second transversal filter having a second set of weighting circuits for applying a second weighting signal to said second transversal filter, means for determining coefficients of the second set of weighting circuits according to the input video signal, and means for producing coefficients of the first set of weighting circuits from an output signal of the second transversal filter.

4,404,601

HEAD TRACKING CONTROL SYSTEM

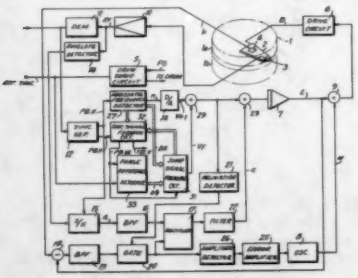
Hitoshi Sakamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 6, 1981, Ser. No. 232,014

Claims priority, application Japan, Feb. 16, 1980, 55-18371

Int. Cl.³ H04N *5/783*

U.S. Cl. 360—10.3 **25 Claims**



1. Apparatus for reproducing information signals recorded in successive parallel tracks on a record medium in any of a plurality of different reproducing modes, said information signals including vertical synchronizing signals also recorded on said record medium, said apparatus comprising:

transducer means movable in a direction along the tracks for reproducing the signals recorded therein;

transducer deflecting means for deflecting said transducer means in a direction transverse to said direction along the tracks;

synchronizing signal forming means for producing substitute vertical synchronizing signals having correct vertical phase continuity for each of said plurality of different reproducing modes in response to one of synchronizing pulses and said recorded vertical synchronizing signals, regardless of any phase discontinuity in said recorded vertical synchronizing signals as reproduced; and

drive signal means for producing a drive signal in response to at least said substitute vertical synchronizing signals and for supplying said drive signal to said transducer deflecting means so as to control the latter to deflect said transducer means to accurately move along said tracks.

4,404,602

PCM SIGNAL RECORDING SYSTEM

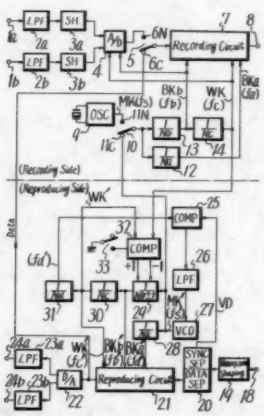
Susumu Hoshimi, Yokohama, and Tadashi Kojima, Yokosuka, both of Japan, assignors to Sony Corporation and Tokyo Shibaura Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 17, 1981, Ser. No. 322,278

Claims priority, application Japan, Nov. 18, 1980, 55-162176

Int. Cl.³ G11B *27/02*, *5/00*

U.S. Cl. 360—13 **16 Claims**

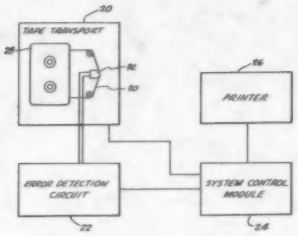


1. A PCM signal recording system comprising, first signal processing means for processing a recording signal into a predetermined PCM signal, second signal processing means for processing a reproduced PCM signal into said recording signal, first clock signal generating means for generating a master clock signal, second clock signal generating means for generating at least one recording clock signal from said master clock, said recording clock signal being supplied to said first signal processing means, third clock signal generating means for generating at least one reproducing clock signal related to said master clock, said reproducing clock signal being supplied to said second signal processing means, comparing means for digitally comparing the phases of said second clock signal and said third clock signal and for producing a control signal, and control means for controlling said second or third clock signal so that they are synchronized with each other receiving said control signal.

4,404,603
APPARATUS AND METHOD FOR INSPECTING MAGNETIC TAPE RECORDED MATERIAL FOR ALTERATIONS

Eugene D. Warren, 12966 Caminito en Flor, Del Mar, Calif. 92014; Lawrence M. Martin, 968 Santa Estella, Solana Beach, Calif. 92075, and Daniel L. Kinnaman, 4164 Terry St., Oceanside, Calif. 92054

Filed May 27, 1980, Ser. No. 153,383
Int. Cl.³ H04N 5/795
U.S. Cl. 360—33.1 16 Claims



1. Apparatus for inspecting the program material recorded on magnetic tape comprising:

a. sensing means for simultaneously detecting a plurality of recording tracks on said tape one of which contains a prerecorded fixed frequency signal added to the program material recorded on that track;

b. means for transporting said tape past said sensing means;

c. circuit means for processing signals detected by said sensing means so that the detection of a signal on a single track alone registers as an error in said tape's recorded program material;

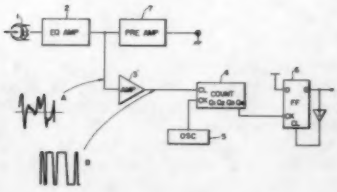
d. means for printing the type and location of errors detected on the tape; and

e. computer processor means for automatically controlling the operation of said tape inspection apparatus.

4,404,604
DEVICE FOR DETECTING A NON-RECORDED SEGMENT ON MAGNETIC TAPE

Yoshiharu Ueki, and Shouzaburou Sakaguchi, both of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 14, 1981, Ser. No. 254,326
Int. Cl.³ G11B 27/22, 19/10, 15/52
U.S. Cl. 360—71 3 Claims

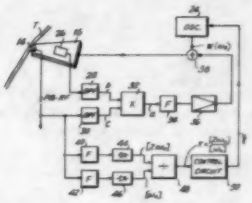


1. A device for detecting non-recorded segments of a predetermined minimum length on a magnetic tape comprising: oscillator means for producing clock pulses of a predetermined frequency; multi-bit counter means having a clear input terminal and a clock terminal, said clock pulses being applied to said clock input terminal; and means for applying a digital signal corresponding to a reproduced signal to said clear input terminal, an output signal indicative of the presence of a non-recorded segment being produced at a higher order bit output of said counter means.

4,404,605
HEAD TRACKING CONTROL SYSTEM

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 4, 1981, Ser. No. 259,959
Claims priority, application Japan, May 8, 1980, 55-60924
Int. Cl.³ G11B 5/52, 21/10, 21/18
U.S. Cl. 360—77 17 Claims



1. Apparatus for reproducing information signals recorded in successive parallel tracks on a record medium, comprising:

transducer means movable in a direction along the tracks for reproducing the signals recorded therein;

transducer deflecting means for controlling the position of said transducer means with respect to said tracks as the transducer means scans the latter;

controllable oscillator means for supplying a wobbling signal to said transducer deflecting means so as to cause the transducer deflecting means to effect oscillatory deflection of said transducer means in a transverse direction with respect to said tracks, said signals reproduced by said transducer means being amplitude modulated at the frequency of said wobbling signal;

tracking error detecting means for supplying to said transducer deflecting means a tracking error signal corresponding to deviation of said transducer means from any one of said tracks being scanned so as to control the transducer deflecting means for correcting said deviation;

signal detecting means for detecting at least a second harmonic component of the amplitude modulated signals reproduced by said transducer means; and

means for controlling the amplitude of the wobbling signal from said controllable oscillator means in accordance with the ratio of the level of at least said second harmonic component relative to a reference level.

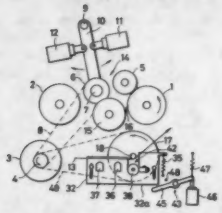
4,404,606
AUTOMATIC MUSIC SELECTING DEVICE FOR TAPE RECORDER

Hideo Watanabe, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,624
Claims priority, application Japan, May 1, 1980, 55-61386[U]
Int. Cl.³ G11B 15/00
U.S. Cl. 360—105 10 Claims

1. An automatic music selecting device for a power assist type tape recorder comprising: a drive gear rotatable together with a flywheel; a reduction gear having a cutaway portion, said reduction gear being engageable with said drive gear; an eccentric cam mounted on said reduction gear for moving a head base between a stop position and a play position; said head base having a reproducing head mounted thereon for detecting a recorded signal on a tape as well as a pinch roller selectively engageable with a capstan, said eccentric cam abutting a rear side of said head base; a rotatation control mechanism for controlling a rotational position of said reduction

gear; and a music selection position stopping mechanism for moving said head base to a music selection position at which said reproducing head is in contact with said tape and said pinch roller is disengaged from said capstan, said music selection position stopping mechanism comprising a music selecting plunger and a stop lever coupled to said plunger, said head base being stopped at said music selecting position by said stop lever.

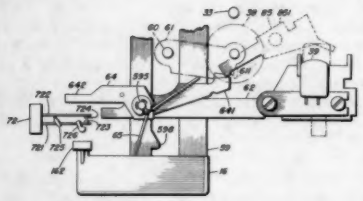


4,404,607

MAGNETIC REPRODUCING APPARATUS

Humio Itai, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 18, 1981, Ser. No. 265,076
Claims priority, application Japan, Jun. 13, 1980, 55-79796
Int. Cl.³ G11B 5/52
U.S. Cl. 360—105 4 Claims



1. A magnetic reproducing apparatus for recording and reproducing information on magnetic tape comprising:

a main chassis (30);

a reproducing operation slider (59) mounted on said chassis to slide in its longitudinal direction;

a reproducing button (16) attached to one end of said slider;

a head lever (62) positioned at substantially a right angle to said slider, said head lever being rotatably mounted on said slider;

magnetic head means (39) attached to said lever for engaging said magnetic tape;

bias means (63) linking said lever to said slider or said button; and

regulation means (598) on said slider for maintaining said lever at substantially a right angle to said slider.

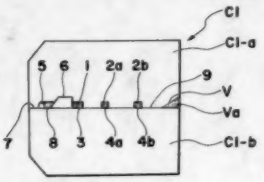
4,404,608

MAGNETIC HEAD WITH AN IMPROVED INNER CORE

Isao Yasuda, Katano; Kazuaki Koyama, Hirakata, and Yoshihiko Kawai, Moriguchi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 4, 1981, Ser. No. 231,321
Claims priority, application Japan, Feb. 4, 1980, 55-12645; Apr. 16, 1980, 55-50809
Int. Cl.³ G11B 5/12, 5/22
U.S. Cl. 360—126 13 Claims

1. A magnetic head including an inner core of metallic magnetizable material sandwiched between a pair of outer reinforcing cores, each having a coil winding insertion opening formed therein, said inner core comprising a first core block which has a front gap defining surface and a back gap defining surface respectively provided at one side and the other side of said first core block and a coil winding recess provided in a position adjacent to said front gap defining surface, and which is formed, between said front gap defining surface and said coil winding recess, with a space for setting the lower end of said front gap defining surface and a brazing material layer connecting said space with said coil winding recess, and a second



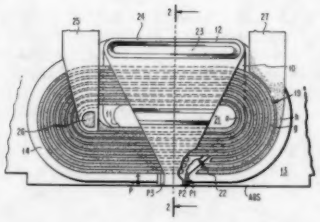
core block to be combined with said first core block so as to constitute said inner core, each of the reinforcing cores corresponding to the required size and shape of the inner core, as produced by machining, and being arranged, in a perspective view of the magnetic head as assembled, to be contactable with the inner core of magnetizable material so as to sandwich the front gap of the inner core therebetween with mechanical strength and for providing a stable magnetic head with high reliability.

4,404,609

THIN FILM INDUCTIVE TRANSDUCER FOR PERPENDICULAR RECORDING

Robert E. Jones, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1981, Ser. No. 315,592
Int. Cl.³ G11B 5/12, 5/22
U.S. Cl. 360—126 10 Claims



1. A thin film inductive transducer, provided on a substrate having an air bearing surface, for perpendicular recording and reading of magnetic transitions on a movable magnetic recording medium, characterized by:

three thin film magnetic layers disposed in superposed spaced relation on the substrate, with the second layer intermediate the first and third layers, to define a pair of magnetic transducing gaps in a pole tip region adjacent the air bearing surface;

at least one single layer of conductive turns disposed between said first layer and second layer;

said first layer contacting said second layer in an area encircled by the conductive turns for forming a split ring enclosing the portion of said conductive turns between said area and the pole tip region to constitute a first magnetic closure; and

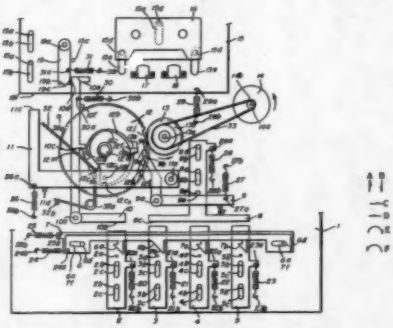
said first layer contacting said third layer outboard of the conductive turns for forming another split ring to constitute a second magnetic closure; thereby to provide pulses capable of being sensed by peak detection techniques.

4,404,610

MODE SELECTION ASSEMBLY FOR USE IN TAPE RECORDERS OR THE LIKE

Satoru Koizumi; Hiroaki Nakao, and Takashi Tsuchitani, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 14, 1981, Ser. No. 254,175
Claims priority, application Japan, Apr. 15, 1980, 55-51071; Apr. 15, 1980, 55-51072; Apr. 15, 1980, 55-51073
Int. Cl.³ G11B *15/24, 15/44*
U.S. Cl. 360—137 15 Claims



1. A power assisted mode selection assembly for a recording and playback tape machine comprising:

a main chassis;

a plurality of levers, individually, operatively, movably mounted on said main chassis;

a subchassis movably mounted on said main chassis;

actuating means being movably mounted on said main chassis for selectively imparting movement to said subchassis;

rotating means being intermittently driven for selectively imparting movement to said actuating means;

a cam surface including a plurality of humps being operatively affixed to said rotating means;

engaging means being operatively connected for selective movement to a predetermined number of said plurality of levers for selectively engaging one of said plurality of humps on said cam surface to stop the rotation of said rotating means;

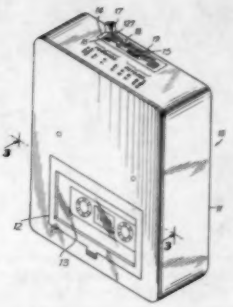
wherein each of said plurality of levers may be manually, individually actuated to select one of a plurality of predetermined operating modes of said tape machine and said rotating means providing a power assist to impart movement to said actuating means and said subchassis, and said engaging means being selectively actuated to engage one of said plurality of humps on said cam surface to stop the rotation of said rotating means to maintain said subchassis in a predetermined operating mode and being selectively movable out of engagement with one of said plurality of humps to permit rotation of said rotating means for selection of another predetermined operating mode.

4,404,611

BIDIRECTIONAL CASSETTE TRANSPORT

Richard Demenus, New York, N.Y., assignor to Acoustiquide Corporation, New York, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,664
Int. Cl.³ G11B *5/00, 15/00, 15/10*
U.S. Cl. 360—137 12 Claims



1. A bidirectional cassette tape player assembly comprising a base plate, a tape head carrier member mounted on said base plate for linear movement, a tape head member on said carrier member, a pair of spaced parallel capstans on said base plate, drive means operatively connected to said capstans for rotating the same in opposite directions about axes of rotation normal to the direction of linear movement of said carrier member, a pair of turntables rotatably mounted on said base plate in parallel spaced relation to said capstans, a pulley member coaxially aligned with each said turntable, a drive member coupling each said capstan with a pulley member, friction clutch means interposed between each said pulley and turntable and loosely frictionally coupling the same for conjoint rotation, a control lever mounted on said carrier member for rocking movement about an axis parallel to and positioned on a center line disposed between said capstans, said lever including spaced actuator arms, first and second cam members, each operatively associated with a respective said arm, each said cam member being disposed in proximate relation to one of said clutch means, each said arm member being effective to increase the frictional coupling forces of one of said turntable to one of said pulleys selectively responsive to rocking movements of said lever of a predetermined magnitude to opposite sides of said center line.

4,404,612

DC SOLID STATE OVERLOAD RELAY

Ronald W. Hughes, Madison, and Leonard J. Srnka, Independence, both of Ohio, assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Dec. 14, 1981, Ser. No. 330,087
Int. Cl.³ H02H *7/085*
U.S. Cl. 361—31 8 Claims

1. An overload relay circuit for a DC motor having a constant potential contactor type control system or an adjustable voltage control system and a standard ammeter shunt comprising:

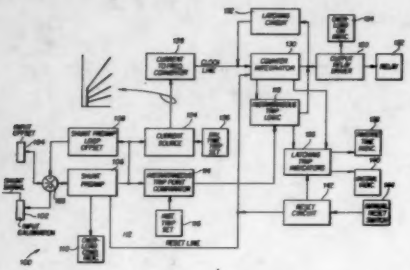
input circuit means for calibrating the output signal of said shunt and outputting an overload signal when said input signal exceeds a first predetermined value;

instantaneous adjustable trip comparator means for tripping said relay when said overload signal exceeds a second predetermined value;

delayed relay trip circuit means responsive to said overload signal for tripping said relay when said overload signal exceeds a third predetermined value for a predetermined period of time;

automatic-manual reset circuit responsive to said relay tripping signals to reset said delayed and instantaneous relay trip circuit; and

latching trip indicator circuit responsive to the output of said



instantaneous trip comparator to indicate that said trip comparator circuit has output a relay trip signal and responsive to said delayed relay trip circuit means to indicate that said relay trip circuit means has output a signal whereby the cause of said trip relay is indicated.

4,404,613

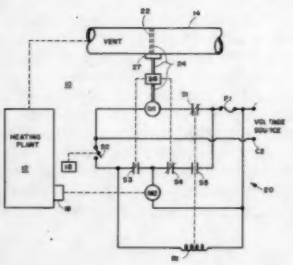
DOUBLE SWITCH FUSE ASSEMBLY

Christopher P. Channing, Central Islip, and William Z. Rovinsky, Old Bethpage, both of N.Y., assignors to Flair Manufacturing Corp., Hauppauge, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,245

Int. Cl.³ H02H *5/10*

U.S. Cl. 361—104 **5 Claims**



1. In an automatic control system for a heating plant having a burner, first motor means for supplying fuel to said burner, and a heating stack for discharging the products of combustion, said heating stack containing a damper vane moveable between a closed position wherein said stack is closed to flow and an open position wherein said stack is open to flow, the improvement comprising means for mechanically biasing said damper vane into its open position, second motor means upon energization for overcoming said biasing means and moving and maintaining said damper vane into and in its closed position, voltage source means for energizing said motor means, a normally closed first switch and said second motor means forming a first series circuit connected to said voltage source means thereby normally maintaining said damper vane in its closed position, a normally open second switch, solenoid means in response to closing of said second switch for opening said first switch thereby causing deenergization of said second motor means and movement of said damper vane by its biasing means into its open position, a third switch mechanically linked to said damper vane to be closed only when said damper vane is substantially fully in its open position, said third switch and said second switch being in series with each other and forming part of a second series circuit connected to said voltage source means, both of said series circuits being in parallel with each other, means in response to closing of said second switch and movement of said damper vane from its closed position into its open position for causing closing of said third switch for energizing said first motor means, and fuse means destructing in response to closing of said second switch at a time when said third switch is short circuited through for at least partially disabling said control system.

4,404,614

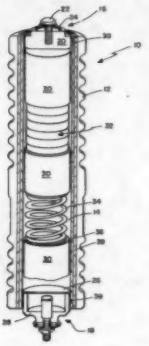
SURGE ARRESTER HAVING A NON-FRAGMENTING OUTER HOUSING

Robert E. Koch, Pittsfield, and Daniel D. Bergh, Lenox, both of Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 15, 1981, Ser. No. 264,008

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—128 **8 Claims**



1. A surge arrester comprising: an outer elongated housing of relatively resilient, electrically insulating and non-tracking material defining a longitudinal chamber extending from one end of the housing to an opposite end thereof; first and second chamber closing means respectively including electrical terminals located at said chamber ends; means including a plurality of arrester components in series relationship with one another within said housing chamber for providing a high or low electrical impedance path between said terminals depending upon the voltage across the latter; a high flexural strength thermal insulating inner liner disposed between said arrester components and the inner surface of said housing; and an intermediate moisture impervious liner constructed of glass flakes in epoxy resin between said inner liner and said elongated housing.

4,404,615

ANTI-STATIC CONTAINER FOR ELECTRONIC COMPONENTS

Barry Dep, Castro Valley, Calif., assignor to United Plastics, Corp., Oakland, Calif.

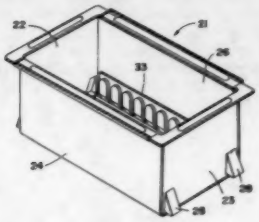
Filed Dec. 14, 1981, Ser. No. 330,432

Int. Cl.³ H05F *3/02*

U.S. Cl. 361—212 **6 Claims**

1. An anti-static device for supporting a plurality of electronic circuit boards, comprising; a container dimensioned to receive said plurality of circuit boards, liner means disposed within said container, said liner means formed of an anti-static material, said liner means comprising a liner having a bottom panel and side portions extending upwardly from opposed

edges of said bottom panel, slot means formed in said liner to receive and support edge portions of said circuit boards in



upwardly extending fashion, and means for connecting said liner to ground potential.

4,404,616

IGNITING AND FLAME DETECTING DEVICE

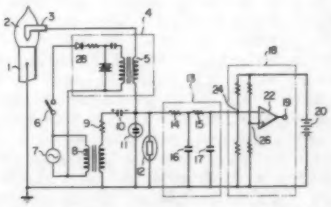
Motoshi Miyanaka, and Kenzi Toudo, both of Yanai, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,643

Claims priority, application Japan, Apr. 16, 1980, 55/49211

Int. Cl.³ F23Q *3/00*

U.S. Cl. 361—253 **6 Claims**



1. An igniting and flame detecting device comprising:

electrode means disposed close to a burner for producing a spark for firing gas issuing from the burner;

high voltage pulse generating means connected in series with said electrode means through a discharge tube for applying a high voltage pulse to said electrode means through said discharge tube;

flame detecting means for detecting the presence or absence of a flame produced when the gas is fired based on rectifying effects of the flame, said detecting means including a series circuit composed of flame detection AC means, a resistor and a capacitor and connected in parallel with said discharge tube for applying an AC voltage to said flame through said high voltage pulse generating means, and a detection circuit connected to said series circuit for detecting a DC voltage component produced across said capacitor due to the rectifying effects of said flame; and

a gap discharge element connected in parallel with said discharge tube and designed to start its discharge at a voltage level which is higher than a voltage level at which said discharge tube normally starts its discharge.

4,404,617

HIGH-FREQUENCY CIRCUIT DEVICE HAVING A CIRCUIT BOARD FIXED TO A SHIELD CASING BY PROJECTIONS OF THE SHIELD CASING AND SOLDERING

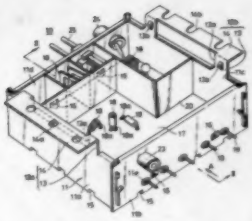
Sadahiro Ohyama, No. 1474-12, Chigasaki, Chigasaki-City, Kanagawa-ken; Hiroshi Kato, No. 2-16-7, Tsurukawa, Machida-City, Tokyo, and Kazuo Matsukawa, No. 667, Takakura, Fujisawa-City, Kanagawa-ken, all of Japan

Continuation of Ser. No. 63,555, Aug. 3, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,222

Claims priority, application Japan, Sep. 14, 1978, 53-112942; Aug. 3, 1979, 54-108173[U]

Int. Cl.³ H05K *5/04*

U.S. Cl. 361—424 **10 Claims**



1. A high-frequency circuit device comprising:

a metal shield casing with surrounding side walls;

a printed circuit board-shield plate segment assembly supported horizontally within said casing, comprising a printed circuit board having electrical elements thereon and shield plate segments which are perpendicular to said printed circuit board and define the electrical elements into a plurality of groups;

holding means for provisionally holding said assembly inside said casing so as to prevent displacement as between said case and said assembly through mechanical contact between said assembly and said casing; and solder parts for permanently fixing both the top of said shield plate segments and the bottom of said printed circuit board to said side walls of said casing by applying solder to corresponding positions in a state where said assembly is provisionally held to said casing by means of said provisional holding means, said provisional holding means comprising projection parts formed on said side walls of said casing, said projection parts bent from said side walls along a vertical axis and including vertex parts and said vertex parts of said projection parts making contact with the top of said shield plate segments of said assembly, said solder parts between the top of said shield plate segments and said projection parts being dip-soldered parts.

4,404,618

FLASH DEVICE

Tateo Yamada, Yokohama; Toshiharu Mamiya, Kawasaki, and Kazuo Ikawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,183

Claims priority, application Japan, Sep. 12, 1980, 55-126865; Dec. 23, 1980, 55-183136; Dec. 23, 1980, 55-186510

Int. Cl.³ F21K *5/02*; G03B *15/02*

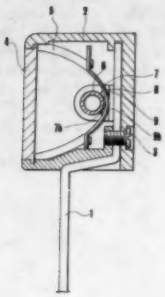
U.S. Cl. 362—17 **9 Claims**

1. A flash light emitting device including:

a flash tube, said flash tube being coated with a trigger electrode;

a back metal which serves as at least a portion of a reflection mirror and an electric current path for a triggering signal applied to said back metal, said back metal being provided with embossed portions; and

means for pressing said flash tube against said embossed portions so that the contact of the flash tube with the back metal



and the adjustment in position of said flash tube relative to the back metal are effected.

4,404,619

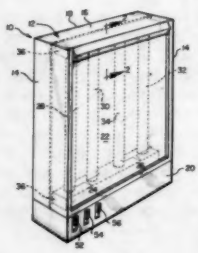
ILLUMINATOR BOX

Bruce A. Ferguson, 233 S. Quincy, Hinsdale, Ill. 60521

Filed Feb. 18, 1982, Ser. No. 349,827

Int. Cl.³ F21S *3/00*

U.S. Cl. 362—222 **10 Claims**



1. A variable intensity illuminator box for reading x-rays and the like comprising:

a housing;

a translucent screen mounted on one side of the housing;

at least two sets of illuminating means supported within the housing, each of said sets being optically connected to and operable to illuminate the entire surface of the translucent screen;

at least two different illumination sources comprising each set of illuminating means;

control means operatively connected to each set of illuminating means to selectively energize one or more illumination sources of each set to illuminate the entire surface of the translucent screen, whereby variable degrees of intensity can be provided to read x-rays and the like supported on the translucent screen.

4,404,620

LUMINAIRE

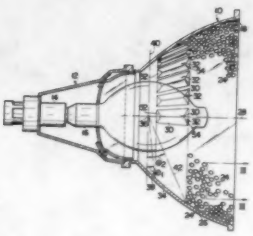
Sadao Takahashi, Yokohama, and Nobuo Matsushita, Tokyo, both of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Filed Dec. 4, 1980, Ser. No. 213,023

Claims priority, application Japan, Dec. 11, 1979, 54-160983

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—304 **30 Claims**



1. A luminaire comprising:

a light source;

a reflector surrounding said light source and reflecting light emitted by said light source to a desired direction;

said reflector including a first region formed on an inner surface of said reflector located at a first position adjacent a light projecting end portion;

a second region formed on said inner surface of said reflector located between said first region and a second position adjacent a base end portion of said reflector and having a smooth reflecting surface;

a plurality of substantially identical reflecting surface units positioned in said second region, each having slanted opposite side portions which intersect each other, wherein said plurality of reflecting surface units are arranged in a circumferential direction at fixed intervals such that a plurality of smooth reflecting surface portions are defined between each two adjacent reflecting surface units and each connect said first and second positions and wherein a first imaginary straight line segment connecting a first end of said reflecting surface units and a light center of said light source forms a first fixed angle with a reference plane normal to an axis of said reflector and containing said light center and a second imaginary straight line segment connecting a second end of said reflecting surface units and light center of said light source forms a second fixed angle with said reference plane; and

said first region further comprises a plurality of hammer tone finished reflecting surfaces.

4,404,621

METHOD AND DEVICE FOR MOUNTING LIGHTS TO CHRISTMAS TREES

Louis D. Mauro, 125 Weldin Park Dr., Wilmington, Del. 19803

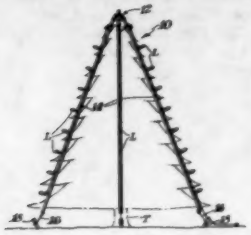
Filed Sep. 10, 1981, Ser. No. 300,934

Int. Cl.³ F21M *3/18*

U.S. Cl. 362—419 **18 Claims**

1. A device for mounting lights to an upstanding tree or the like comprising a crown for being positioned at the top of the tree, said crown including a closed loop collar, a plurality of elongated tracks pivotally mounted to and extending from said collar, each of said tracks having a pulley associated therewith mounted on said collar, guide means slidably mounted in each of said tracks, and said guide means including retaining means

whereby a string of lights or the like may be secured to said guide means and selectively moved toward and away from said



crown by a cord or the like secured to said string and positioned over a respective one of said pulleys.

4,404,622

STABILIZED POWER SUPPLY

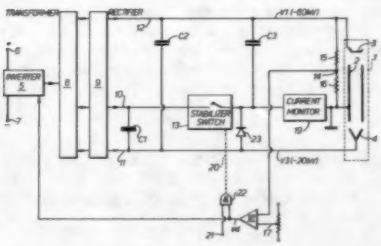
Peter J. Cherry, Huncote, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Mar. 8, 1982, Ser. No. 355,844

Claims priority, application United Kingdom, Mar. 6, 1981, 8107168

Int. Cl.³ H02M *3/315;* H02P *13/18*

U.S. Cl. 363—27 **10 Claims**



1. A stabilised power supply including a resonant inverter circuit arranged to generate an a.c. voltage from input d.c. power applied to it; a transformer for receiving the a.c. voltage and transforming it to a different a.c. voltage; a rectifier for converting the a.c. voltage to a corresponding d.c. voltage; and first and second capacitive smoothing stages which are charged by said d.c voltage and connected to said rectifier in series, with a controllable switch being positioned between the two stages; means for monitoring the voltage on the second capacitive stage and for rendering said switch non-conductive when said d.c. voltage reaches a reference level and for maintaining the switch open until the completion of the current cycle of the resonant inverter.

4,404,623

METHOD AND APPARATUS FOR BALANCING FLUX IN A POWER TRANSFORMER CIRCUIT

Charles S. Jourdan, Apopka, Fla., assignor to Florida Computer Graphics, Lake Mary, Fla.

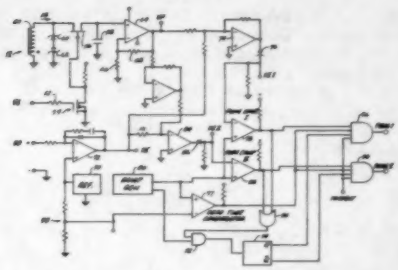
Filed Apr. 23, 1982, Ser. No. 371,443

Int. Cl.³ H02H *7/122*

U.S. Cl. 363—56 **10 Claims**

1. A method of balancing transformer flux in a switching power transformer circuit, which circuit employs pulse width modulation for regulation of output voltage and is driven by an input signal that approximates a square wave, that switches for each respective half cycle of operation between a first circuit section having during the active portion of its operation a first output signal with a first polarity and a second circuit section having during the active portion of its operation a second output signal with a polarity opposite the first polarity, which circuit includes a current sensing device connected in series with the primary winding of the power transformer, which circuit generates a voltage error signal by comparing the output voltage against a reference voltage, and which circuit includes a ramp signal generator for generating a ramp signal, said method comprising the steps of

generating a signal proportional to the current flowing in the primary winding of said power transformer during said active portion of each half cycle of operation of said



circuit that said current sensing device and said power transformer are being driven by said circuit;

integrating said power transformer current-proportional signal with time to generate a flux error signal;

combining said flux error signal with said voltage error signal to generate a first combined signal; and

comparing said first combined signal with said ramp signal and generating from said comparison a signal for controlling the operation of said first circuit section, whereby the duty cycle of that first circuit section controlled by the first pulse width control signal may be adjusted to drive the flux error signal, and thus the direct current flux in the power transformer, toward zero.

4,404,624

POWER CIRCUIT FOR ELECTRONIC TIMEPIECE

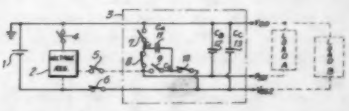
Suguru Yamazaki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,849

Claims priority, application Japan, Jul. 31, 1980, 55-105309

Int. Cl.³ H02M *3/18*

U.S. Cl. 363—59 **24 Claims**



1. A power circuit for an electronic timepiece, said timepiece being a variable load on said power circuit, comprising:

a power supply having a high internal impedance, the output voltage of said power supply being diminished under heavy load;

a voltage booster and reduction circuit for increasing the voltage above the power supply voltage in a first mode of operation, and for reducing the voltage below the power supply voltage in a second mode of operation;

a voltage regulation circuit for providing a stable output voltage;

switching means for selectively engaging with said power supply one of said voltage booster and reduction circuit operating in said second mode and a combination of said voltage regulation circuit and said voltage booster and reduction circuit operating in said first mode;

means for generating a signal in response to the level of said output voltage of said power supply, said signal activating said switching means,

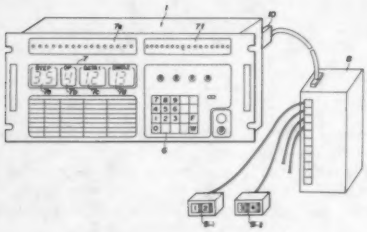
said power circuit operating automatically in one or two operating conditions in response to the power supply voltage magnitude.

4,404,625

PROGRAMMABLE LOGIC CONTROLLER

Yoshitane Saito, Kameoka; Akihiro Yamada, Kyoto, and Satoshi Yano, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 25, 1981, Ser. No. 247,284
Claims priority, application Japan, Mar. 26, 1980, 55-38518
Int. Cl.³ G05B *19/04*; G06F *15/46*
U.S. Cl. 364—144 **4 Claims**



1. A programmable logic controller comprising:

(a) a program memory for storing a program expressed in the form of a combination of a first instruction code for indicating the kind of process operation and a second instruction code containing modified data to specify the operating conditions of the process operation of the kind expressed by said first instruction code;

(b) a plurality of external numerical data setters for manually entering numerical data relating to said operating conditions;

(c) an input device for writing any desired program into said program memory and for entering a specific code indicating external data has been entered in at least one of said data setters so that an external data reference command is stored in a predetermined area of said modified data;

(d) a central processing unit (CPU) for sequentially reading out such instructions stored in said program memory and for sending out control signals in conformity with said instructions, the CPU having connecting means for connecting said plural external numerical data setters to said CPU;

(e) reference command code detection means for checking whether external data reference command is present in said predetermined area of modified data of said instruction read-out prior to the execution of the instruction read-out from said program memory;

(f) numerical data read-out means to read-out the numerical data set at a data setter when such an external data reference command is detected; and

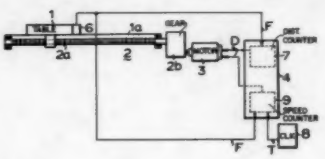
(g) replacement control means replacing the part or the whole of the modified data of that instruction containing said external data reference command code in the modified data with data readout from said external numerical data setter.

4,404,626

POSITIONING CONTROLLING METHOD

Tadamasa Aoyama, Yokohama, Japan, assignor to Kabushiki Kaisha Sanesu Shoko, Yokohama, Japan

Filed Feb. 2, 1981, Ser. No. 230,499
Int. Cl.³ G05B *13/02*
U.S. Cl. 364—174 **6 Claims**



1. Apparatus for controlling the deceleration of a motor driven body comprising:

means for detecting the present velocity of the body and for providing a first signal representative thereof;

means for detecting the present position of the body and for providing a second signal representative of the desired velocity of the body at the detected position;

means for comparing said first and second signals to provide an error signal and for controlling the motor driving the body in response thereto;

means for applying a first deceleration signal to the motor driving the body; and

means for detecting the instant at which the output energy of the motor driving the body equals the kinetic energy of the body and for applying a second deceleration signal to the motion driving the body in response thereto,

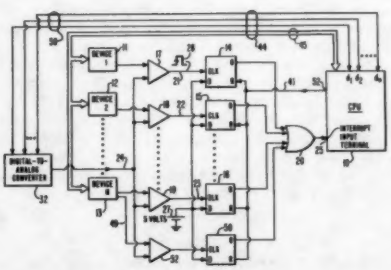
whereby the strain on the body is reduced and the precision of control of the body enhanced.

4,404,627

INTERRUPT SIGNAL GENERATING MEANS FOR DATA PROCESSOR

Angelo R. Marcantonio, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 11, 1979, Ser. No. 38,282
Int. Cl.³ G06F *13/00, 3/00*
U.S. Cl. 364—900 **5 Claims**



1. In a system comprising a plurality of devices each requiring periodic attention and indicating such requirement by generating a unique dc output voltage, a circuit for generating a first signal indicating that one of such devices has generated its unique output voltage and requires attention and for generating an address signal identifying which of the devices requires such attention and comprising:

first means for iteratively generating a predetermined series of binary values each consisting of N bits in parallel and

each defining an identifying address signal identifying one of said devices;

second means responsive to said binary values to generate a predetermined series of dc reference voltages each coincident with and corresponding to one of said binary values and having a value which is equal to one of said unique dc output voltages;

logic means comprising a plurality of voltage comparators each having first and second input terminals;

means for supplying each of said unique dc output voltages to a selected one of said first input terminals and for supplying said dc reference voltages to all of said second input terminals;

said logic means responsive to the occurrence of substantially equal voltages being supplied to the first and second input terminals of one of said voltage comparators to generate said first signal; and

utilization means responsive to the occurrence of each of said first signals to receive the binary value coincident therewith.

4,404,628

MULTIPROCESSOR SYSTEM

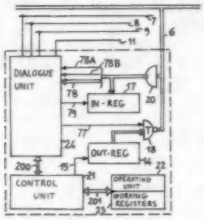
Bardotti Angelo, Peschiera Borromeo, Italy, assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 1, 1980, Ser. No. 211,962

Claims priority, application Italy, Dec. 3, 1979, 27787 A/79

Int. Cl.³ G06F *13/06*

U.S. Cl. 364—200 **1 Claim**



1. A multiprocessing system comprising a plurality of processors and a memory unit coupled to each other through a common bus to which each processor can gain access on request for an information exchange with said memory unit or for notification to another of said processors, said memory unit comprising:

a control section for granting bus access to one of said processors at a time on a priority basis and on request from said processors respectively;

a plurality of storage resources, each one related to one processor and accessible by all the processors for receiving and storing messages intended for the related processor;

timing means activated by a control signal received through a first bus lead for starting one memory cycle and for generation of a first end signal on a second bus lead on termination of said memory cycle;

said each processor comprising:

first means set by the bus access granted to said processor for loading said first bus with said control signal starting a memory cycle and holding said bus until reset by a signal received from said second bus lead;

second means for generating signals representative of its own processor name;

third means for loading third bus leads with signals representative of the name of a processor to which messages are intended to be notified, along with a notification signal;

fourth means for receiving through said third bus leads a signal representative of the name of a notified processor and said notification signal;

a comparator coupled to said second and said fourth means for comparing its own processor name with said notified processor name and for generating a notify signal when said names are equal;

storing means for storing said notify signal so that the notified processor is autonomously able to recognize said notify signal in said storing means at any time, without requiring attention of the notifying processor;

fifth means for the generation of a second end signal on said second bus lead concurrently with the storing of said notify signal in said storing means for resetting said first means in a notifying processor;

said memory further comrising:

sixth means for receiving said notification signals through one of said third bus leads and for inhibiting in response thereto the activation of a memory cycle by said control signal;

said plurality of storage resources each being operative to receive messages from said procesors intended for its related processor and to store said messages therein until access by its related processor upon said recognition of the notify signal in its related processor.

4,404,629

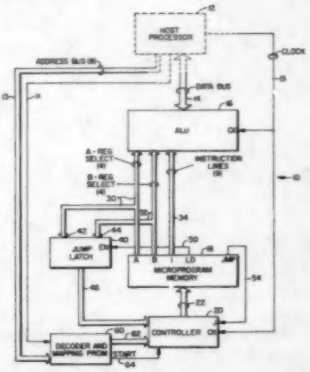
DATA PROCESSING SYSTEM WITH LATCH FOR SHARING INSTRUCTION FIELDS

Michael E. Albaugh, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Jan. 26, 1981, Ser. No. 228,441

Int. Cl.³ G06F *9/28, 9/26, 9/42*

U.S. Cl. 364—200 **6 Claims**



1. A circuit for sharing a microinstruction bit field to control register selection of an arithmetic logic unit and to specify a jump address, the circuit comprising:

a memory element containing a plurality of addressable microinstructions, the microinstructions being addressed in response to address signals, the addressable microinstructions including a first field, a second field, a jump field, and a load field, at least one of the addressable microinstructions containing data in the load field corresponding to a load instruction and data in the jump field corresponding to a jump instruction, the first field selecting a data register for an arithmetic operation and containing a jump address simultaneously;

an arithmetic logic unit coupled to the memory element to receive the data in the first and second fields of the addressable microinstructions, the arithmetic logic unit having a plurality of selectable data registers, the arithmetic logic unit selecting a data register in response to data in the first field of the one addressed microinstruction, the arithmetic logic unit for performing an arithmetic operation on the data contained in the selected register, the

operation selected in response to data in the second field of the one addressed microinstruction;

a storage element coupled to the memory element to receive the data in the first and the load fields of the addressable microinstructions and to store data contained in the first field in response to the data in the load field corresponding to a load instruction; and

an address circuit coupled to the memory element and to the storage element for receiving stored data from the storage element and the data in the jump field of the addressable microinstructions, the address circuit providing address signals to the memory element, the address signals provided in a sequence in response to the absence of data in the jump field corresponding to a jump instruction, address signals corresponding to the received stored data in response to the data in the jump field corresponding to a jump instruction.

4,404,630

DATA-EXTRACTION CIRCUITRY FOR PCM COMMUNICATION SYSTEM

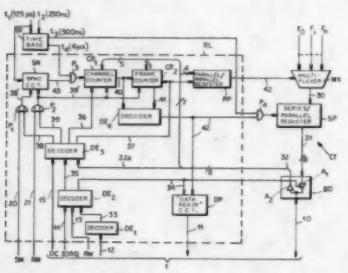
Piero Belforte, and Renzo Bortignon, both of Turin, Italy, assignors to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Feb. 19, 1981, Ser. No. 235,947

Claims priority, application Italy, Feb. 20, 1980, 67259 A/80

Int. Cl.³ H04Q *11/04;* H04J *3/14*

U.S. Cl. 364—200 7 Claims



1. In a pulse-code-modulation communication system wherein a plurality of lines carry respective frames each composed of a multiplicity of multibit channels assigned to different time slots of a recurrent frame period,

the combination therewith of a data extractor delivering data bits of a selected channel from a designated line to a control device, said data extractor comprising:

a multiplexer with data inputs respectively connected to said lines and with an output connected to said control device via a normally inoperative data transmitter;

a normally blocked first data store in said output connection;

a second data store with an output connected to a switching input of said multiplexer;

a source of timing pulses coinciding with said time slots;

presettable counting means connectable to said source in response to a starting command from said control device for stepping by said timing pulses into a terminal state reached at an instant when a time slot assigned to the selected channel appears on the designated line, said counting means unblocking said first data store in said terminal state;

circuitry connected to said control device for loading said second data store with a first numerical code identifying the designated line and for presetting said counting means with a second numerical code representing the position of the selected channel in the corresponding frame, said numerical codes being available at an input connection emanating from said control device, said circuitry including decoding means for supplying said numerical codes from said input connection to said counting means and to said second data store in response to a writing command from said control device, said decoding means being responsive to a reading command from said control device for activating said data transmitter; and

signal-transmitting means responsive to the attainment of said terminal state by said counting means for informing said control device of the availability of extracted data in said first data store, preparatorily to the emission of said reading command by said control device.

4,404,631

METHOD OF AND DEVICE FOR CODING AND DECODING AN IMAGE OF AN OBJECT BY MEANS OF PENETRATING RADIATION

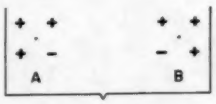
Hermann Weiss, and Klaus Pasedach, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

PCT No. PCT/NL80/00001, § 371 Date Jan. 21, 1981, § 102(e) Date Jan. 21, 1981, PCT Pub. No. WO81/01952, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 10, 1980, Ser. No. 233,616

Int. Cl.³ G06F *15/336;* A61B *6/02*

U.S. Cl. 364—414 11 Claims



1. In a method for coding and decoding an image of an object which comprises the steps of: forming superposed, coded shadow images of the object by irradiating the object with radiation emitted in different directions from point sources of radiation, recording the superposed images on a recording medium, and subsequently decoding the coded images formed by convolving of the superposed shadow images with a function which is representative of the distribution of the point sources used to irradiate the object; the improvement wherein:

the step of irradiating the object comprises irradiating the object with radiation which is emitted from point sources which are distributed in a regular matrix and are divided into at least three groups so that the position of the sources in a first combination of the groups is described by a first source distribution function and the position of the sources in a further combination of the groups is described by a second source distribution function and the sum of the autocorrelation functions of the first and second source distribution functions has a nonzero value at a single point and a zero value at all other points;

the step of forming the coded images includes successively activating each of the groups of point sources to form a corresponding number of successive superposition images and

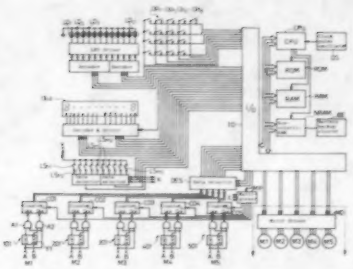
the step of decoding includes the steps of convolving positives and/or negatives of the superposition images, with point image functions of the groups of sources to form convoluted images; and summing the convoluted images to produce a decoded image.

4,404,632

ATTITUDE CONTROL SYSTEM FOR DRIVER'S SEAT

Kuniyoshi Harada, Takahama, and Naofumi Fujie, Tokyo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 17, 1981, Ser. No. 235,173
Claims priority, application Japan, Mar. 31, 1980, 55/41338
Int. Cl.³ B60N 1/02; G06F 15/20
U.S. Cl. 364—425 7 Claims



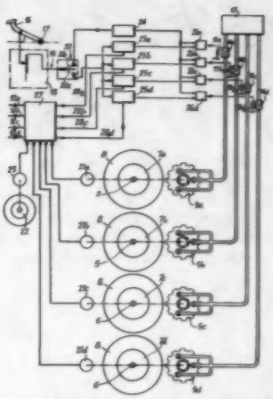
1. Attitude control system for driver's seat comprising:
seat attitude setting means;
driving means adapted to drive the seat attitude setting means;
signal generator means coupled to the seat attitude setting means for generating an electric pulse for each movement of the seat attitude setting means;
a plurality of key switches;
a character display; and
an electronic control device comprising electronic processor means and memory means including a read only memory, a read-write memory and a non-volatile, read-write memory, said memory means storing standard attitude data corresponding to human data indicative of the physical features of a driver,
said electronic control device being capable of reading standard attitude data which corresponds to the human data inputted with the key switches from the memory means and controlling the energization of the driving means for establishing an attitude indicated by the read-out standard attitude data with reference to actual attitude data based on the counting of electric pulses,
said electronic control device storing acutal attitude data at a predetermined address of the non-volatile, read-write memory when an identification code and a memory instruction are inputted by the key switches, said address corresponds to the identification code inputted,
said electronic control device being responsive to input of an identification code and a set instruction with the key switches, reading the attitude data at the address which corresponds to the inputted identification code, controlling the energization of the driving means for establishing an attitude indicated by the attitude data corresponding to the inputted identification code with reference to the actual attitude data based on the counting of the electric pulses, and
said electronic control device, during the energization of the driving means, forming the actual attitude data by counting up or down the electric pulses depending on the drive direction of the seat attitude setting means and storing the actual attitude data in the non-volatile, read-write memory as the current attitude data after it stops the energization of the driving means.

4,404,633

PROCESS AND DEVICE FOR BRAKING AN AIRCRAFT BY SEEKING AN OPTIMAL SLIDING OF THE BRAKED WHEELS

Jose R. Goicoechea, Blagnac, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 7, 1981, Ser. No. 223,220
Claims priority, application France, Jan. 11, 1980, 80 00558
Int. Cl.³ G06F 15/50
U.S. Cl. 364—426 11 Claims



1. Process for braking an aircraft taxiing on the ground after landing, said aircraft comprising a plurality of braked wheels, comprising the steps of:
dividing said braking into a plurality of successive braking periods;
sub-dividing each of said braking periods into a first relatively short interval and a second substantially longer interval;
imposing on each of said wheels a predetermined different reference sliding value during said first interval;
determining for each wheel a coefficient of adherence corresponding to the sliding value imposed thereon;
establishing from said imposed sliding values and corresponding coefficients of adherence a relationship expressing the coefficient of adherence of said wheels as a function of the sliding value imposed thereon;
determining from said relationship an optimal sliding value resulting in the maximum value of the coefficient of adherence; and
imposing said optimal sliding value on all of said wheels during said second interval.

4,404,634

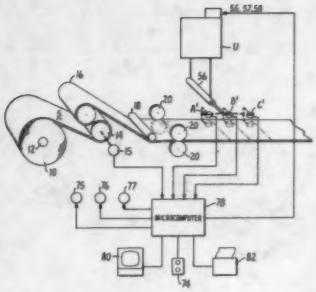
LATERAL WEAVE GAGING SYSTEM

James E. Bautz, Uplands, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

Filed Apr. 27, 1981, Ser. No. 257,921
Int. Cl.³ G01B 7/34
U.S. Cl. 364—472 6 Claims

1. Apparatus for determining sinusoidal variations in the edges of moving sheet metal as the sheet metal is passed from uncoiling means, subjected to on-line processing conditions while in flat form and while moving at a high rate of speed, and rewound in coil form, comprising,
means for measuring the line speed of said moving sheet,
sensor means located at three fixed spaced locations along the edges of said sheet and adapted to detect lateral displacement of said sheet edges within the plane of the sheet from a reference line in the form of sine waves,
means for measuring the time period for each said complete

sine wave whereby the period length of each said sine wave can be determined based on said time period and said line speed,



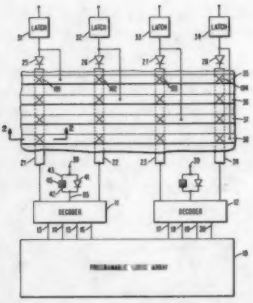
and means for determining the maximum amplitude of each said sine wave based on said time period and said detected lateral displacement at said three fixed spaced locations.

4,404,635

PROGRAMMABLE INTEGRATED CIRCUIT AND METHOD OF TESTING THE CIRCUIT BEFORE IT IS PROGRAMMED

Roy C. Flaker, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1981, Ser. No. 248,646
Int. Cl.³ G01R *31/26, 15/12*
U.S. Cl. 364—481 **8 Claims**



1. A method of testing a programmable circuit prior to programming comprising;

providing a first element, having a selected impedance, integral with the circuit,

providing a second element, having a selected impedance, integral with the circuit,

said second element being in parallel with said first element,

said second element having an impedance substantially higher than the impedance of the first element,

measuring the electrical characteristics of the circuit by applying selected voltages to said circuit, and

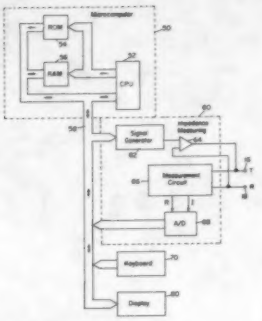
reducing the impedance of said second element to a value substantially below the impedance value of the first element it is in parallel with to alter the total impedance of the circuit.

4,404,636

PHASOR IMPEDANCE MEASURING TEST SET

Richard H. Campbell, Jr., Gilford, and John B. Noyes, Laconia, both of N.H., assignors to Wilcom Products, Inc., Laconia, N.H.

Filed Apr. 8, 1981, Ser. No. 252,260
Int. Cl.³ G01R *27/00*
U.S. Cl. 364—482 **6 Claims**



5. Test set apparatus, comprising:

measurement terminals for connection to a circuit under test;

means for measuring at a selected measurement frequency the phasor impedance of a circuit under test;

keyboard input means for entering test parameter information into the test set;

a microcomputer interfaced to the keyboard input means and the impedance measuring means, and including a memory for storing test parameter information entered into the test set by said keyboard input means, for storing phasor impedance measurement values, and for storing reference phasor impedance measurement values;

said microcomputer controlling said phasor impedance measuring means to measure the phasor impedance of a circuit under test at a plurality of measurement frequencies within a range of frequencies, and storing the phasor impedance measurements in memory;

said microcomputer calculating the ratio of return power to incident power at each measurement frequency using the stored phasor impedance measurement values and reference phasor impedance measurement values;

said microcomputer weighting each return power ratio with a weighting factor and summing the weighted return power ratios,

said microcomputer summing the weighting factors,

said microcomputer dividing the sum of the weighted return power ratios by the sum of the weighting factors to produce a weighted-average return power ratio;

said microcomputer calculating the logarithm of the weighted-average return power ratio and multiplying by −10 to calculate a weighted-average return loss over the range of measurement frequencies for the circuit under test; and

a display interfaced to the microcomputer for producing a visual readout of the calculated weighted-average return loss as a test result.

4,404,637

PROCESS CONTROL SYSTEM

John O. Walters, and William B. Bard, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1981, Ser. No. 258,969
Int. Cl.³ G05B *15/00*; F01D *17/02*
U.S. Cl. 364—494 **8 Claims**

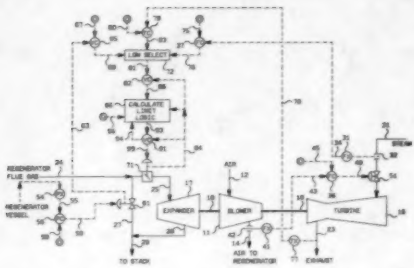
1. Apparatus comprising:

a first control valve means for manipulating the flow of a fluid;

means for establishing a first signal representative of the desired position of said first control valve means;

means for establishing a second signal representative of the actual position (P) of said first control valve means;

a velocity controller for comparing said first signal and said second signal and for establishing a third signal which is representative of any change (ΔP) which must be made in the position of said first control valve means in order for said first signal to remain substantially equal to said second signal;



a position controller which requires a velocity set point;

means for establishing a fourth signal which is representative of the position set point (A_n) generated by said position controller in response to said velocity set point;

means for establishing a fifth signal which is representative of a driving force limit (R);

means for establishing a sixth signal representative of the value of said fourth signal one time period earlier (A_{n-1});

means for calculating said velocity set point (ΔA) for said position controller in response to said second signal, said third signal, said fifth signal and said sixth signal, wherein said velocity set point is represented by

$$\Delta A = \begin{cases} P + R - A_{n-1} \text{ when } A_{n-1} + \Delta P > P + R \\ \Delta P \quad \text{when } P - R \leq A_{n-1} + \Delta P \leq P + R \\ P - R - A_{n-1} \text{ when } A_{n-1} + \Delta P < P - R \end{cases}$$

means for supplying said first signal to said position controller, wherein said position controller compares said first signal and said fourth signal to establish a seventh signal which is representative of the driving force which must be applied to said first control valve means; and

means for manipulating said first control valve means in response to said seventh signal.

4,404,638

FLOW RATE MEASURING DEVICE

Tetsuo Yada, Zama, and Takeo Wada, Kawasaki, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Dec. 17, 1980, Ser. No. 217,391

Claims priority, application Japan, Dec. 20, 1979, 54-176517[U]

Int. Cl.³ G01F *1/08*

U.S. Cl. 364—510 **10 Claims**

1. A flow rate measuring device, comprising:

first generating means for generating a pulse in response to a fluid flow to be measured,

counting means for counting the generated pulses from said first generating means and generating a counted value for said pulses,

detecting means for detecting the difference between the temperature of the fluid and a reference temperature,

arithmetic operating means for executing a digital operations as follows:

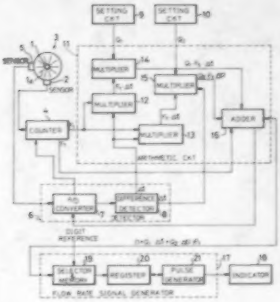
$$F_f + [(Q_1) \cdot \Delta T + (Q_2) \cdot \Delta T^2] \cdot F_f$$

where

F_f is the counted value from said counting means,

Q_1 and Q_2 are constant values defined with the specific gravity of the fluid respectively, and ΔT is a value from the temperature difference from said detecting means; and

second generating means having adding means for adding a



result value of the operation from the arithmetic operation means to a previous result value of the operation supplied thereto, the previous result value being smaller than a reference value, dividing means for dividing the added result value from said adding means by said reference value into a first value which is smaller than the reference value and a second value which it not less than the reference value, means for storing the first value from said dividing means and for supplying to said adding means the previously stored first value as said previous result value of the operation, and producing means for producing a flow rate signal based on the second value from said dividing means.

4,404,639

AUTOMOTIVE DIAGNOSTIC SYSTEM

John F. McGuire, Orinda; J. Steven Hurt, Alameda, and Ronald L. Wilkerson, Novato, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 2, 1980, Ser. No. 212,301

Int. Cl.³ G06F *11/32, 15/20*

U.S. Cl. 364—551 **25 Claims**

1. An apparatus for facilitating the diagnosing and servicing of an automotive vehicle from service request to completed servicing and invoicing comprising:

(a) diagnostic test equipment including means for attaching said equipment to said vehicle and means for measuring operating conditions of said vehicle;

(b) a display means;

(c) means for entering into said display means vehicle identification data unique to said vehicle;

(d) data base storage means, said data base including specifications for automotive vehicles including said vehicle to be serviced;

(e) means for selecting from said data base the specification data unique to said vehicle in accordance with said vehicle identification data and means for transferring said selected specifications to said diagnostic test equipment attached to said vehicle,

(f) means for transferring measured data representing the current operating condition of said vehicle from said diagnostic test equipment to said display means,

(g) means for producing a printed record and a stored record

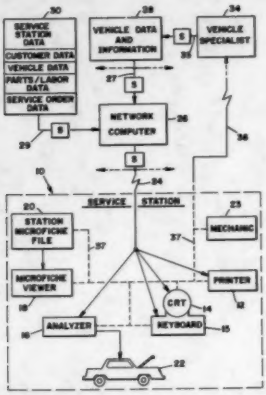
of said transferred measured data and said specification data,

(h) means for selecting service manual index data unique to said vehicle from said data base in accordance with said vehicle identification data and means for transferring said indices to said display means,

(i) means for selecting parts data unique to said vehicle from said data base in accordance with said vehicle identification data and means for transferring said parts data to said display means,

(j) means for selecting diagnostic and service remarks unique to said vehicle from said data base in accordance with said vehicle identification data and means for transferring said diagnostic and service remarks data, to said display means, and

(k) means for producing a stored record and a printed record of said data supplied to said display means.



4,404,640

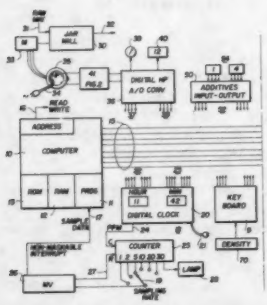
GRINDING MILL MONITORING INSTRUMENTATION

Robert F. Dumbeck, Elgin, and Phillip W. Welch, Houston, both of Tex., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 223,833, Jan. 9, 1981. This application Feb. 27, 1981, Ser. No. 238,710

Int. Cl.³ B02C *25/00*

U.S. Cl. 364—551 18 Claims



1. Instrumentation for monitoring the operating performance of an electric motor driven grinding mill comprising in combination,

means for monitoring and indicating the electric motor current of the mill drive motor as the mill operates,

means for calculating from a range of variations of said motor current as an input signal mill operating performance indicia representative of the internal grinding status of the mill and means for displaying the mill grinding status in each of a range of mill loads derived from said performance indicia, so that the mill operating conditions may be adjusted in response to the displayed mill grinding status to operate the mill in a predetermined mill load range.

4,404,641

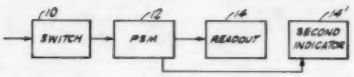
MAINTENANCE MONITOR

Louis M. Bazarnik, Jericho, N.Y., assignor to Dierckx Equipment Corporation, Long Island City, N.Y.

Filed Feb. 17, 1981, Ser. No. 234,769

Int. Cl.³ G06F *15/20*; G08B *19/00*

U.S. Cl. 364—569 7 Claims



1. A running-time maintenance monitor for indicating when equipment to be operated is due for maintenance, said monitor comprising:

(a) user-settable means for manually setting a predetermined maintenance time indicative of when the equipment being operated is due for maintenance;

(b) running time sensor means for detecting only the running time of the equipment each time the latter is operated;

(c) control means responsive to the running time sensor means, and operative for accumulating each running time, and for generating a control signal when the accumulated running time corresponds to the predetermined maintenance time set by the user; and

(d) indicator means responsive to generation of the control signal, and operative for indicating when the equipment is due for maintenance.

4,404,642

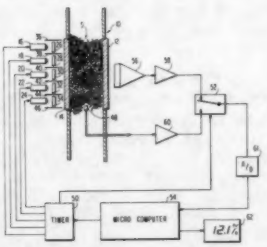
APPARATUS FOR NEAR INFRARED QUANTITATIVE ANALYSIS WITH TEMPERATURE VARIATION CORRECTION

Robert D. Rosenthal, Gaithersburg, Md., assignor to Trebor Industries, Inc., Gaithersburg, Md.

Filed May 15, 1981, Ser. No. 263,881

Int. Cl.³ G06F *15/20*; G01N *21/00*

U.S. Cl. 364—571 6 Claims



1. An apparatus for near infrared quantitative analysis providing for correcting wide temperature variations of a sample, the apparatus comprising:

(a) means for holding a sample to be analyzed including at least a portion of a wall thereof being transparent to infrared energy,

(b) a plurality of infrared emitting diodes positioned to transmit infrared energy toward the sample in the holding means,

(c) means for sequentially pulsing the infrared emitting diodes,

(d) a plurality of narrow bandpass filters between the infrared emitting diodes and the sample holding means to produce desired wavelengths required for quantitative analysis,

(e) sensor means positioned to receive and sense infrared energy transmitted through the sample to be analyzed contained in the holding means, said sensor means producing a signal related to the infrared energy received thereby,

(f) temperature measuring means positioned in the sample holding means to measure the temperature of the sample therein and to produce a signal related thereto,

(g) computer means for receiving the signals from the sensor means and the temperature measuring means and combining them in a multiple regression equation to compensate for variations in sample temperature, and

(h) means for reading out the results of the analysis from the computer means.

4,404,643

PORTABLE ELECTRONIC CALCULATOR WITH A WRITING INSTRUMENT

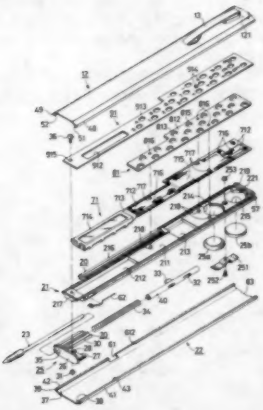
Shin Ojima; Kazutaka Watanabe, and Hiroshi Iwasaki, all of Yao, Japan, assignors to Hosiden Electronics Co., Osaka, Japan

Filed Feb. 12, 1981, Ser. No. 233,716

Claims priority, application Japan, Feb. 27, 1980, 55-24761[U]

Int. Cl.³ G06F *3/02*

U.S. Cl. 364—705 **10 Claims**



1. A portable electronic calculator with a writing instrument, comprising:

a rectangular, elongated, thin body having a plurality of calculator element housing portions respectively aligned with one another in the lengthwise direction of said body, said body also having an elongated, narrow writing element housing part formed between one of the side edges of said body and at least one of said calculator element housing portions and extending in the lengthwise direction of said body along said one of said side edges of said body;

a keyboard provided on one portion of a flat panel surface of said body for inputting numeric values and functions;

semiconductor integrated circuit means housed in one of said calculator element housing portions and connected to said keyboard for conducting a calculation corresponding to the input from the keyboard;

display means provided on another portion of said flat panel surface, said display means being housed in another one of said calculator element housing portions and connected to said semiconductor integrated circuit means for displaying the input numerical values and the calculation result;

battery means housed in at least one further one of said calculator element housing portions for supplying power to the semiconductor integrated circuit means;

writing means housed in said writing element housing part of said body and held therein in such a manner that said writing means can freely be projected out from one end face of the body; and

an elongated rectangular metal cover which is demountably mounted on said body for covering said panel surface of said body and for reinforcing said thin body when said cover is mounted on said body, both side edges of said elongated cover being bent inwardly to form U-shaped configurations in cross section which are adapted respectively to slidably engage the opposing elongated side edges of said body so that said cover may be slid along the body in its lengthwise direction for removal therefrom.

4,404,644

WAVEFORM GENERATOR

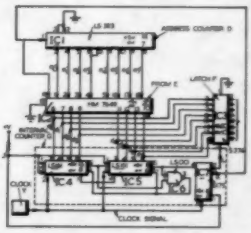
Ian H. Howie, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed May 14, 1981, Ser. No. 263,516

Claims priority, application United Kingdom, May 22, 1980, 8017013

Int. Cl.³ G06F *1/02*

U.S. Cl. 364—718 **1 Claim**



1. A waveform generator for generating a plurality of repetitive rectangular wave type waveforms having a common repetition period which is an integral number of periods of a clock signal, each waveform being digital (i.e., either ON or OFF) and having transitions between ON and OFF occurring synchronously with pulses of the clock signal, said generator comprising:

a digital storage device preprogrammed with waveform data and with time interval data for said waveforms, said time interval data identifying the time intervals between successive transitions of the plurality of said waveforms over their common repetition period and said waveform data identifying the respective amplitudes of the plurality of waveforms during each said time interval,

address means including an address counter for addressing the storage device to deliver selected data at the output of the storage device,

an interval counter and a waveform-delivery latch connected in parallel to the output of the storage device, and

a clock pulse source connected to the count input of the interval counter to advance the count number in the interval counter,

wherein said interval counter includes a loading circuit which is intermittently activated by the interval counter attaining a predetermined count number, the activated loading circuit

being effective to load data at the output of the storage device into the interval counter and to preset the count number therein to a value determined by the loaded data, means included in said loading circuit for delivering a first output signal to said latch to condition the latch to transfer the data at the output of the storage device to the latch output each time the count number for the interval counter equals a fixed small number of clock pulses less than said predetermined count number, for delivering a second output signal to the count input of the address counter to advance the count therein, and for delivering a third output signal as an address bit in addition to the address bits from the said address counter to address the storage device to deliver time-interval data for loading into said interval counter, and means for delivering a fourth output signal as an address bit in addition to the address bits from the said address counter to address the storage device to deliver waveform data for transfer to the latch output each time a fixed small number of clock pulses has been delivered to the interval counter after attainment of said predetermined count number.

4,404,645

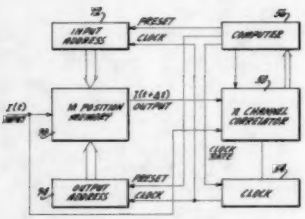
CORRELATOR

Virgil B. Elings, P.O. Box 6463, Santa Barbara, Calif. 93111, and David F. Nicoli, 448 Mills Way, Goleta, Calif. 93017

Filed Aug. 18, 1980, Ser. No. 179,036

Int. Cl.³ G06F *15/34*

U.S. Cl. 364—728 **24 Claims**



1. A correlator for producing a correlation function by processing input data over a large number M of correlation coefficients by time sharing a smaller number n of channels of processing electronics wherein $n>1$ and $M>n$, including

a temporary storage device for receiving input data and for providing the input data as output data at particular successive time delay intervals relative to the input data and with each time delay interval representing at least a plurality of channels,

an n-channel correlator comprising a storage device for storing n-channels of data, multiplying means for each channel and summing means for each channel to sum the outputs of the multiplying means, and with the n-channel correlator responsive to the output data from the temporary storage device and to additional data for correlating a group of n-channels of data where $n>1$ and for providing n output sums representing successive points of the correlation function, and

means coupled to the temporary storage device and the n-channel correlator for controlling the coupling of the output data from the temporary storage device to the n-channel correlator to have groups of output data at the successive time delay intervals coupled to the n-channel correlator to have the n-channel correlator repetitively correlate successive groups of n-channels for providing M coefficients of correlation built up from the repetitive correlation of groups of n-channels and wherein $M>n$.

4,404,646

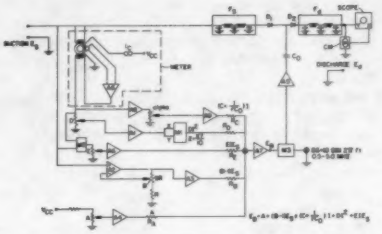
PIPING NETWORK ANALOG APPARATUS

Carl E. Edlund, Castroville, and Cecil R. Sparks, San Antonio, both of Tex., assignors to Southern Gas Association, Dallas, Tex.

Filed Dec. 29, 1980, Ser. No. 220,287

Int. Cl.³ G06G *7/57*

U.S. Cl. 364—803 **1 Claim**



1. An electrical analog of a piping network having a centrifugal compressor or pump therein comprising:

(a) a capacitor pump for simulating the pumping action of a centrifugal compressor and having circuits connected to its input and output simulating the piping upstream and downstream of said compressor:

(b) means for applying voltages to the input and output of said capacitor pump which are proportional to the suction and discharge pressures of said compressor:

(c) and electrical means for driving said capacitor pump to cause it to simulate the action of the centrifugal compressor in said piping network including:

i. means for scaling a constant voltage by a fourth factor A

ii. first means for sensing the suction voltage,

iii. means for scaling the output of said first means by a first factor (B-1)

iv. means for sensing and scaling the current flow through said capacitor pump by a second factor

$$\left(C+\frac{1}{fCo}\right)$$

v. means for squaring and scaling said current flow respectively by a third factor D

vi. means for multiplying the suction voltage by the current and means for scaling the result by a fifth factor E; and

means for adding the outputs of items (ii), (iii), (iv), (v) and (vi) to provide a sum voltage Eb; and

means for generating a sinusoidal voltage having an ampitude proportional to said sum voltage as the driving voltage for said capacitor pump.

4,404,647

DYNAMIC ARRAY ERROR RECOVERY

Darryl S. Jones; Donald W. Larkin; Michael F. Toner, and Carleton E. Werve, all of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,092

Int. Cl.³ G06F *13/00, 11/00*

U.S. Cl. 364—900 **10 Claims**

1. For use in a data processing system:

two logically distinct memory arrays, containing identical data in corresponding locations thereof;

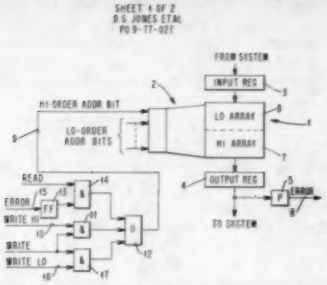
selection means selectively and mutually exclusively logically connecting the outputs of said logically distinct memory arrays to other parts of said data processing system so the output of a first one of said logically distinct

memory arrays is logically connected to other parts of said data processing system;

detection means for detecting an error in data read from said logically distinct memory arrays; and

reversing means responsive to the detection of a first error by said detection means to cause reversal of said selection means thereby logically connecting the output of the second of said logically distinct memory arrays to other parts of said data processing system;

said reversing means being further responsive to the detection of another error by said detection means to again cause reversal of said selection means to logically reconnect the output of said first one of said logically distinct memory arrays to other parts of said data processing system.



4,404,648

METHOD FOR CONTROLLING AN INSTRUMENT PANEL DISPLAY

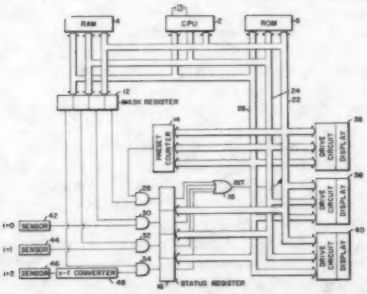
Nobuaki Miyakawa, and Masayuki Miki, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1979, Ser. No. 56,224

Claims priority, application Japan, Jul. 19, 1978, 53-87060

Int. Cl.³ G06F 9/46, 3/14

U.S. Cl. 364—900 **6 Claims**



3. A display system for displaying a plurality of measured values comprising

a plurality of sensing means for generating a plurality of signals each consisting of a series of pulses at a frequency proportional to a respective one of said values;

a status register having a plurality of stages each individually settable by an applied pulse;

gate means for selectively connecting the output signal of each sensing means to a respective stage of said status register;

a mask register for controlling said gate means to selectively mask one or more output signals from said sensing means by preventing said signals from being applied to said status register;

interrupt request generating means for generating an interrupt request signal each time any one of the stages of said status register is set;

central processing means responsive to interrupt request signals for controlling said mask register to control said gate means so that said interrupt request generating means receives pulses from only one sensing means during successive periods of time and for measuring the intervals between interrupt request signals from the one sensing means in each of the successive periods for calculating measured values to be displayed;

a plurality of display means responsive to said central processing means for displaying said calculated measured values; and

counter means controlled by said central processing means for setting a stage of said status register at periodic intervals, said central processing means being responsive to an interrupt request signal generated as a result of said counter means for applying said calculated measured values to said display means.

4,404,649

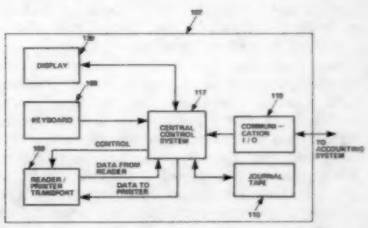
DOCUMENT PROCESSING SYSTEM

Leonard J. Nunley; Willis D. Simpson, both of Dallas, and William J. Reid, Richardson, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Nov. 3, 1980, Ser. No. 202,970

Int. Cl.³ G06F *[illegible]*

U.S. Cl. 364—900 **9 Claims**



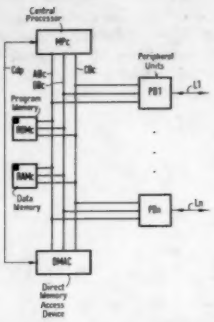
1. A system for processing documents having machine readable characters on the face of each document and for assigning a number unique to the document, comprising; terminal means for automatically and manually capturing data from documents, means within said terminal for generating a unique source item identification number of each document, the derviation of said identification number based in part upon the particular terminal usd, printer means within said terminal for printing the source item identification number on each document along with data manually input to said terminal, storage means in said terminal for creating a record for each document which may include all or part of the data captured from the document and the source item identification number, a controller unit for controlling the function of each of the above means and coordinating the operation of said terminal, and means interconnected with said controller means for transmitting the record of each document to an accounting system.

4,404,650

METHOD AND CIRCUIT ARRANGEMENT FOR TRANSMITTING BINARY SIGNALS BETWEEN PERIPHERAL UNITS WHICH ARE CONNECTED TO ONE ANOTHER VIA A CENTRAL BUS LINE SYSTEM

Helmuth Kleinert, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 27, 1981, Ser. No. 228,959
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003340
Int. Cl.³ G06F 9/00
U.S. Cl. 364—900 7 Claims



1. A circuit arrangement for transmitting binary signals comprising:

a plurality of peripheral units which are connected to signal generators and signal receivers and which may be conditioned to a transmitting state, a receiving state or a starting state;

a central bus line system interconnecting said peripheral units for carrying control, data and address signals on respective control, data and address bus lines;

a central control device connected to said bus line system and including a central microprocessor, a data memory, a program memory and a direct memory access device each connected to said bus line system;

request signal means in each of said peripheral units operable to transmit a request message to said central control device including a transmission request signal and addresses of other peripheral units which are to receive binary signals, said central microprocessor operable to poll said peripheral units for said request messages and transmit a respective setting-up signal to said other peripheral units;

each of said peripheral units comprising means responsive to the respective setting-up signal to transfer the respective peripheral unit from the starting state to the respective transmitting or receiving state;

each of said peripheral units including means operable in the transmitting state to transmit a signal transmission request signal to said direct memory access device, said transmission request signal indicating the number of binary signals to be transmitted, and said direct memory access device responsive to said transmission request signal to transmit a deactivation signal to said central microprocessor to prevent the transmission of signals therefrom to said bus line system;

each of said peripheral units comprising a buffer for intermediate storage of signals supplied thereto by other peripheral units and by the respective signal generator and an internal control device which is responsive to said request message to apply control signals to said buffer enabling the same for a respective read or write operation, said buffer including an address input connected to said internal control device and to an address bus line of said central bus line system;

said direct memory access device including means operable to transmit special control signals in an alternating sequence to the peripheral units together with the addresses which designate access to said buffer of a peripheral unit in the transmitting state for the transmission of binary signals to said buffers of those peripheral units in the receiving state; and

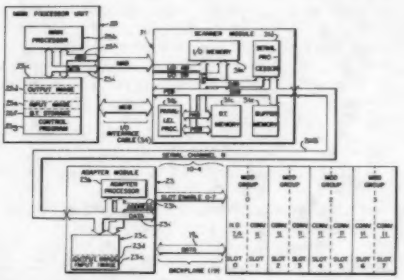
means in said direct memory access device for monitoring the number of binary signals transmitted and operable in response to the transmission of the number of binary signals indicated by said signal transmission request signal to transmit a reset signal to reset said peripheral units into their starting states.

4,404,651

PROGRAMMABLE CONTROLLER FOR USING CODED I/O DATA TECHNIQUE

Raymond A. Grudowski, S. Euclid, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 9, 1981, Ser. No. 242,048
Int. Cl.³ G05B 19/02; G06F 3/04
U.S. Cl. 364—900 10 Claims



1. A digital controller of a type having a main processor which executes a control program to examine and change I/O status data, and which senses and controls I/O devices on a controlled system through I/O modules which are located in an I/O interface rack and which communicate with the main processor via I/O status data, wherein the improvement comprises:

the I/O interface rack being located remotely from the main processor;

I/O memory means coupled to the main processor for storing I/O status data that has been examined and changed by the main processor during execution of the control program, wherein the I/O status data is stored in an I/O image table with memory locations corresponding to respective I/O modules in the I/O interface rack;

a serial data link extending from a near end proximate the main processor to a remote end at the I/O interface rack; and

a scanner electrically coupled to the I/O memory means and to the near end of the serial data link and an adapter located with the I/O modules and electrically coupled to the remote end of the serial data link, the scanner and the adapter each having

first means electrically coupled to a respective end of the serial data link for selectively transmitting I/O status data for one or more of the I/O modules together with an associated mask word over the serial data link;

second means electrically coupled to the first means for generating the associated mask work with a bit pattern that correlates the I/O status data to one or more respective I/O modules; and

third means electrically coupled to a respective end of the serial data link for receiving and selectively coupling I/O status data from the serial data link i) to the I/O

memory means at the near end of the serial data link and ii) to the I/O modules at the remote end of the serial data link, for the scanner and adapter respectively, according to the bit pattern of the associated mask word that is received with the I/O status data.

4,404,652
SIDE FEED EXPANDER

Richard D. Holmes, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

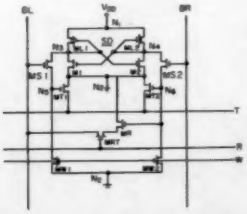
Filed Aug. 27, 1981, Ser. No. 296,620
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—8 **9 Claims**

1. The combination comprising:
at least two expander bubble propagation elements arranged in a first row of an expander and having their surfaces uniformly spaced in juxtaposition including a first element at one end of said row and a second element at the other end of said row, said first expander element having a first side with a middle portion and first and second end portions, said second expander element having a first side with a middle portion and first and second end portions,
an input bubble propagation element associated with one of said first sides in said first row,
a second row of bubble propagation elements positioned in said expander on a first side of said first row, and
a third row of bubble propagation elements positioned in said expander on the second side of said first row whereby a bubble propagating from said input element to one of said expander elements first sides will expand to form a stripe in said expander.

4,404,653
ASSOCIATIVE MEMORY CELL AND MEMORY UNIT INCLUDING SAME

Smil Ruhman, and Isaac Scherson, both of Rechovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Oct. 1, 1981, Ser. No. 307,664
Int. Cl.³ G11C *15/04, 11/40*
U.S. Cl. 365—49 **10 Claims**

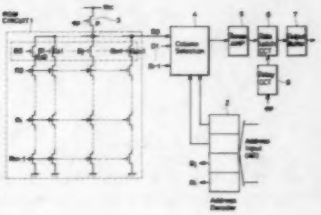


1. An associative memory cell including: a storage device having a pair of biasing nodes and a pair of output nodes; a plurality of access lines accessing said storage device and including a pair of BIT-lines and a TAG-line; and a plurality of gates controlling the accessing of said storage device by said access line; characterized in that said plurality of gates include:
a pair of sampling gates under the control of the BIT-lines and connecting the output nodes of the storage device to a pair of sampling nodes; and
a pair of TAG-gates under the control of said sampling nodes and connecting the TAG-lines to one of the pair of the storage device biasing nodes.

4,404,654
SEMICONDUCTOR DEVICE SYSTEM

Setsufumi Kamuro, Yamatokoriyama, and Yoshifumi Mazaki, Tondabayashi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1981, Ser. No. 229,508
Claims priority, application Japan, Jan. 29, 1980, 55-9549; Jan. 31, 1980, 55-11828
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—103 **12 Claims**



1. A semiconductor read only memory circuit comprising:
a row by column memory array having field effect transistors serially interconnected source to drain in columns, transistors in corresponding positions of respective columns having their bases interconnected to form address lines, each said transistor representing a bit in memory and being of an enhancement type to represent a first binary logic state and being of a depletion type to represent a second binary logic state;
output means for receiving information from each of said columns;
first means for selectively sampling desired ones of said columns; and
second means for selectively sampling desired ones of said address lines;
said first and second means collectively defining a desired bit in memory;
the logic state of said transistor representing said bit being determined by whether said transistor is said enhancement type or depletion type.

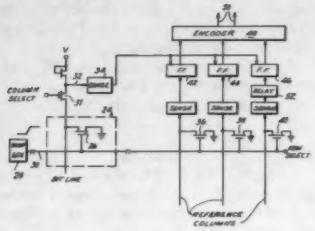
4,404,655
DATA SENSE APPARATUS FOR USE IN MULTI-THRESHOLD READ ONLY MEMORY

Kenneth L. Naiff, Hauppauge, N.Y., assignor to General Instrument Corporation, New York, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,717
Int. Cl.³ G11C *7/00, 11/56, 17/00*
U.S. Cl. 365—104 **11 Claims**

1. A read only memory comprising a plurality of multi-state cells interconnected in a ROM matrix, each of said cells comprising a FET, and the FET of each ROM cell having substantially the same surface area and shape, and having one of at least three possible states; means for selecting a particular one of said cells to be read; means for applying to a selected cell, an input signal varying in amplitude with time for stimulating an output signal from said cell in accordance with the state of said

cell, said output signal being of one at least two possible amplitude levels; said input signal varies slowly with time, and said



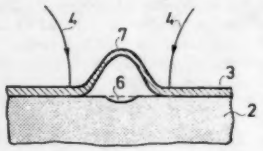
output signal being displaced in time depending upon the state of said cell.

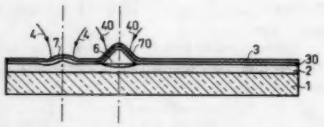
4,404,656

THERMO-OPTICAL DATA WRITING PROCESS AND DATA MEDIUM FOR PERFORMING THIS PROCESS

Jean Cornet, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 21, 1981, Ser. No. 226,803
Claims priority, application France, Jan. 23, 1980, 80 01423
Int. Cl.³ G11C *11/46, 13/04*
U.S. Cl. 365—126 **20 Claims**





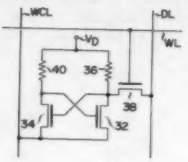
1. A thermo-optical data writing process consisting of the surface heating by means of an intensity-modulated, focused radiation beam of a thermosensitive data medium having a first metal layer of ductile material covering an organic intermediate layer, and separated therefrom by an intermediate metal layer wherein the thermal energy given off in the metal layers by the impact of the beam causes gas evolution by local degradation of the organic intermediate layer, this gas evolution and the loss of adhesion associated therewith lead to stretching in the metal layers beyond the elastic limit and less than the elongation required to break the ductile material constituting said metal layers, and the first metal layer is an alloy of metals selected to provide desired adhesion, range of deformation and shock resistance to rupture.

4,404,657

SEMICONDUCTOR MEMORY CIRCUIT

Tohru Furuyama, Yokohama, and Tetsuya Iizuka, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 16, 1980, Ser. No. 197,564
Claims priority, application Japan, Oct. 19, 1979, 54-134904
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 **6 Claims**



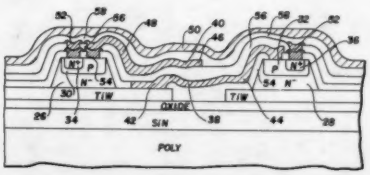
1. A semiconductor memory circuit which comprises:
at least one memory cell;
at least one word line;
at least one data line segment, only a single data line segment being provided for each memory cell; and
at least one control voltage line whose potential is set at one of different levels in accordance with a selected operation mode;
said at least one memory cell including a first MOS transistor whose source is connected to said control voltage line, a second MOS transistor whose gate and drain are connected to the drain and gate of said first MOS transistor and whose source is connected to said control voltage line, first and second load resistive means respectively connected to the drains of said first and second MOS transistors, and a third MOS transistor whose gate is connected to said word line, and whose current path is connected between the drain of said first MOS transistor and said data line segment, the drains of said first and second MOS transistors being connected to a power supply terminal impressed with a high voltage through the corresponding first and second load resistive means, and said at least one control voltage line being held at a high voltage for a predetermined period of time in the write mode and set at a low voltage during the read mode.

4,404,658

MESA BIPOLAR MEMORY CELL AND METHOD OF FABRICATION

Kenneth A. Ports, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 129,913, Mar. 12, 1980. This application May 21, 1981, Ser. No. 266,069
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 **2 Claims**



1. In a memory cell having a pair of bipolar transistors cross-coupled by their bases and collectors and an individual load resistor connected to the collectors of each transistor, the improvement comprising:
support means;

first and second metallic collector contact on said support means;

first mesa bipolar transistor on said first collector contact and second mesa bipolar transistor on said second collector contact, said first and second mesa bipolar transistors being separated by a valley and each having a collector, base and emitter;

a first resistor in said valley, connected at one end thereof to the collector of said first transistor and the base of said second transistor through apertures in an insulating material;

a second resistor in said valley, connected at one end thereof to the collector of said second transistor and the base of said first transistor through apertures on an insulating material;

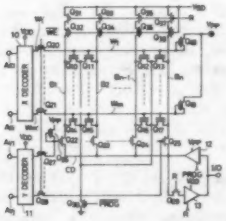
said first and second resistors being connected at their other ends through an aperture in an insulating material there between.

4,404,659

PROGRAMMABLE READ ONLY MEMORY

Toshimasa Kihara, Tachikawa, and Toshifumi Inoue, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1980, Ser. No. 193,411
Claims priority, application Japan, Oct. 5, 1979, 54-127913
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—185 **9 Claims**



8. A programmable read only memory comprising: a bit line; a common source line; a plurality of word lines; word line selection means; writing voltage generator means which applies a writing voltage to said bit line; a plurality of memory insulated gate field effect transistors, each having a control gate connected to a corresponding word line, a floating gate, a drain commonly connected to said bit line, and a source commonly connected to said common source line, an electric charge which serves as writing data being injected into the floating gate of selected insulated gate field effect transistors when the writing voltage and a word line selection voltage are fed to the drain and control gate thereof; and means coupled to said common source line for preventing a leakage current from flowing from said bit line to insulated gate field effect transistors which are not selected when the writing voltage and the word line selection voltage are fed to a selected insulated gate field effect transistor through said bit line and one of said word lines so that said non-selected insulated gate field effect transistors are non-conductive.

4,404,660

CIRCUIT AND METHOD FOR DYNAMICALLY ADJUSTING THE VOLTAGES OF DATA LINES IN AN ADDRESSABLE MEMORY CIRCUIT

Abraham Menachem, Herzlia, Israel, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 23, 1980, Ser. No. 152,950
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—193 **16 Claims**

1. An integrated memory circuit for providing a logic level output signal representative of a bit of data comprising:

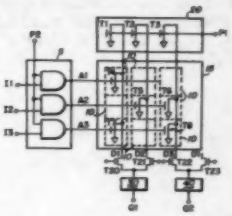
source means for providing first and second voltages;

clock means for providing alternating first and second clock signals;

a conductive data line associated with the bit of data;

memory cell means coupled to the data line, the source means and the clock means for selectively providing a current path between the data line and the first voltage in response to the value of the bit and the second clock signal;

reference means coupled to the data line, the source means and the clock means for providing a current path between the data line and the first voltage in response to the first clock signal, the resistance of the current path provided by the reference means being greater than the resistance of the current path selectively provided by the memory cell means;



amplifier means coupled to the data line and to the source means and characterized by a threshold voltage for providing a logic level output signal representative of the value of the bit in response to the voltage on the data line relative to the threshold voltage; and

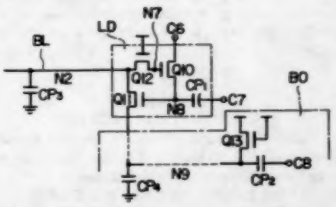
current source means coupled to the amplifier means, to the clock means, to the source means and to the data line for providing current to the data line, the amplitude of the current being adjusted in response to the output signal and the first clock signal such that the voltage of the data line is adjusted to be substantially equal to the threshold voltage during the first clock signal and the amplitude of the current is maintained during a subsequent second clock signal.

4,404,661

SEMICONDUCTOR MEMORY CIRCUIT

Yasuji Nagayama, and Makoto Taniguchi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1980, Ser. No. 202,822
Claims priority, application Japan, Oct. 31, 1979, 54-141783
Int. Cl.³ G11C *7/00, 11/24*
U.S. Cl. 365—203 **5 Claims**



1. A semiconductor memory circuit of the MOSRAM type comprising:

a plurality of bit lines;

a sense amplifier provided for each bit line for sensing a state of a storage cell selectively coupled to said bit line and for

setting said bit line to one of first and second predetermined potentials in response to the sensed state;

a potential decision circuit provided for each bit line for sensing the potential on the corresponding bit line set by said sense amplifier; and

a boost circuit operating in response to an output from said potential decision circuit for increasing a potential on the corresponding bit line above a maximum supply potential when said potential decision circuit senses the presence of a predetermined one of said first and second potentials on said bit line for recharging said selected storage cell at a potential above said maximum supply potential.

4,404,662

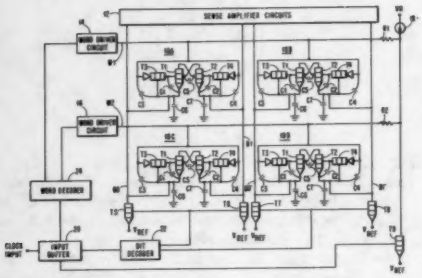
METHOD AND CIRCUIT FOR ACCESSING AN INTEGRATED SEMICONDUCTOR MEMORY

Charles J. Masenas, Jr., Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,396

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—203 **16 Claims**



2. A memory system comprising

a plurality of cells arranged in a plurality of columns and in a plurality of rows,

a plurality of word lines, each connected to a respective row of said cells,

a plurality of pairs of bit/sense lines, each connected to a respective column of said cells,

means for discharging said word lines,

means for selecting one of said word lines and one of said pairs of bit/sense lines having a given cell coupled thereto,

means for electrically floating said one pair of bit/sense lines of said plurality of pairs of bit/sense lines during a given period of time,

means for energizing said one word line of said plurality of word lines to charge said given cell during said given period of time, and

means for detecting a signal between said one pair of bit/sense lines during said given period of time when said given cell is being charged and the remaining cells connected to said one pair of bit/sense lines are being discharged.

4,404,663

INTEGRATED CIRCUIT

Yukihiro Saeki, Yokohama; Fuminari Tanaka, Kawasaki, and Yasoji Suzuki, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 13, 1981, Ser. No. 234,438

Claims priority, application Japan, Mar. 6, 1980, 55-27309

Int. Cl.³ G11C *7/00*

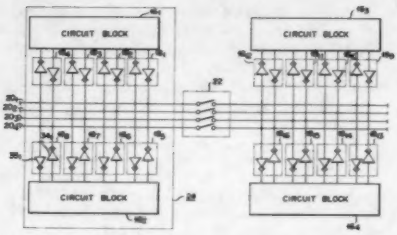
U.S. Cl. 365—206 **4 Claims**

1. An integrated circuit which comprises:

first, second and third circuit blocks for storing data;

a bus line;

first, second and third input-output means with said first input-output means connected between said bus line and said first circuit block, said second input-output means connected between said bus line and said second circuit block, and said third input-output means connected between said bus line and said third input-output block, for supplying data received from said bus line to said respective circuit blocks and for withdrawing data from said respective circuit blocks to said bus line, the connections of said first and second input-output means to said bus line



and the connection of said third input-output means to said bus line being spaced from each other along said bus line; and

gate circuit means coupled to said bus line between said connections of said first and second input-output means and the connection of said third input-output means to said bus line, for separating said first and second circuit blocks from said third circuit block upon transmission of data over said bus line between said first and second circuit blocks.

4,404,664

SYSTEM FOR LATERALLY POSITIONING A TOWED MARINE CABLE AND METHOD OF USING SAME

Robert G. Zachariadis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,733

Int. Cl.³ G01V *1/38*

U.S. Cl. 367—19 **1 Claim**

1. A system for controlling the lateral position of a marine cable being towed by a vessel and having adjustable control surfaces affixed to said marine cable at a plurality of spaced-apart positions along said cable for varying lateral thrust to said cable in response to control signals from the vessel, the improvement comprising:

(a) a motor associated with each control surface for rotating said control surface from a neutral position at which no lateral thrust is imparted to said cable to a second position at which a desired lateral thrust is imparted to said cable,

(b) receiving means associated with each control surface for decoding the control signals from said vessel and producing a first electric current of magnitude and direction necessary to cause said motor to rotate said control surface of said second position,

(c) means associated with each control surface for automatically returning said control surface to said neutral position after the desired lateral thrust has been imparted to said cable by said control surface, said means comprising:

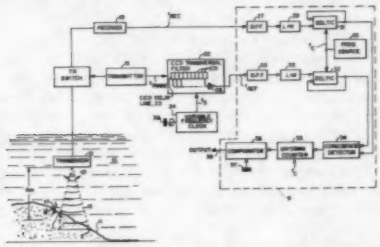
(i) a plurality of switches fixed in circular orientation,
(ii) a cam mounted within the circular orientation of said switches for rotational movement with control surface, the rotational movement of said cam sequentially activating said switches to provide an orientation signal representative of the direction and magnitude of the rotation of the control surface, and
(iii) means for converting said orientation signal to a second electric current of magnitude and direction necessary to cause said motor to rotate said control surface back to said neutral position.

4,404,665

SEA BOTTOM SLOPE COMPENSATION APPARATUS

Arent H. Kits van Heyningen, Newport, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 20, 1980, Ser. No. 198,559
Int. Cl.³ G01S 7/52, 15/02
U.S. Cl. 367—100 16 Claims



1. A sonar transmitting and receiving system for comprising:
transmitter means for transmitting a sonic signal and for directing such transmitted sonic signal towards a reflecting surface;
receiver means for receiving the transmitted sonic signal which is reflected from said reflecting surface;
a transversal filter connected to said transmitter;
means connected to said transversal filter for producing first clock pulses having a controllable frequency;
said filter including means for sampling said transmitted sonic signal and for shifting said sample signal through said filter at a rate related to the frequency of said first clock pulses to provide a replica at the transversal filter output of the received signal;
a correlator circuit means connected to the output of said transversal filter and an output of said receiver means for providing an output signal having a magnitude related to the correlation between said replica of the received signal and the actually received signal.

4,404,666

QUICK DEPLOYMENT VEHICLE

Arthur P. Stevens, Jenkintown; John De Matteo, Doylestown, both of Pa., and Richard M. Beard, Ventura, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 2, 1981, Ser. No. 269,171
Int. Cl.³ B63B 21/28
U.S. Cl. 367—131 5 Claims

1. A quick deployment vehicle for embedment in ocean sediment comprising, in combination:
a streamlined housing having separable fore and aft sections, said fore section including a core mass for imparting an inertial force for penetrating the sediment;
memory means within said housing for storing a programmed predetermined deceleration and for transmitting a signal indicative thereof, said memory means includes a vehicle condition sensor for initiating the predetermined deceleration signal and timing means initiated by said condition sensor for regulating the predetermined deceleration signal as a function of elapsed time;
decelertion sensing means within said housing responsive to the vehicle deceleration for transmitting a signal indicative thereof;

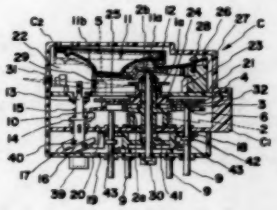
separating means connected to fore and aft sections and responsive to the vehicle deceleration and predetermined deceleration signals for separating said sections when the predetermined deceleration signal exceeds the vehicle deceleration signal.

4,404,667

SOUND REPRODUCING DEVICE DRIVEN BY A CONSTANT TORQUE PULL STRING TYPE SPRING AND STARTED BY SELECTIVE STARTER RODS FOR PLAYING MULTIPLE RECORD GROOVES

Eishi Koike, Sagamikara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,613
Claims priority, application Japan, Oct. 30, 1981, 56-174221
Int. Cl.³ G11B 17/00; A63H 3/33; G11B 3/00
U.S. Cl. 369—65 3 Claims



1. A sound reproducing device for selectively playing any desired one of a plurality of recorded grooves comprising, a constant torque spring wound by a winding string, a record disc driven by said constant torque spring capable of rotating only in a direction of sound reproduction and a pickup urged by a return spring to its directions upward away from said record disc and to the starting point of sound reproduction, wherein the improvement comprises:
a locking block projecting from the reverse face of the record disc and being rotatable together with said record disc;
a plurality of selective starter rods corresponding to the number of recorded grooves each of which rods being positioned at a location in a predetermined relationship to the guide portion of each record groove and capable of being advanced to be engaged with said locking block when depressed;
a retainer piece disposed on the periphery of the record disc being rotatable together with the record disc for temporarily stopping rotation of the record disc;
a speaker unit swingably supported at its one end and capa-

ble of imparting stylus pressure at the lower face of the other end;

a center shaft for receiving said record disc capable of being axially advanced to lift said speaker unit upward against the resilient force given by said stylus pressure;

a plunger upstanding alongside said record disc and being axially movable parallel to said center shaft;

a stopper block projectirg from the side periphery of said plunger for engagement or disengagement with said retainer piece of the record disc for effecting temporary stopping or releasing of the record disc by the respective advancing or retracting motion of said plunger;

a first spring for urging said plunger to the direction of retraction of said stopper block from the engagement with said retainer piece of the record disc;

a lever swingably supported for see-saw like movement being urged by a second spring for locking said stopper block may engage said retainer piece of the record disc;

an intermediate starter member fixed around said center shaft capable of advancing or retracting together with said center shaft and being placed in engagement with said lever to swingably move the lever against the resilient force of the second spring thereby releases said plunger from its engagement with said lever caused by the advance of any one of said selective starter rod;

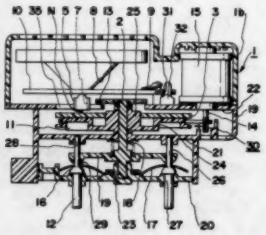
said winding string is passed correlated to both the speaker unit and said plunger so that the winding string when stretched under tension during the time of winding and after the sound reproduction has been finished, lifts said speaker unit to move away from the record face and releases the stylus pressure imparted thereon and causes said plunger to advance against the resilient force of the first spring so as to engage said stopper block with said retainer piece of the record disc, whereby release of the depression of said selective starter rod allows its retraction resulting in both application of stylus pressure to said pickup and the rotation of the record disc for starting sound reproduction.

4,404,668

SOUND REPRODUCING DEVICE

Katsumi Watanabe, Kawasaki, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,618
Claims priority, application Japan, Mar. 17, 1981, 56-38244
Int. Cl.[3] G11B *17/00*; A63H *3/33*; G11B *3/00*
U.S. Cl. 369—65 **4 Claims**



1. A sound reproduction device comprising:

a casing;

a record disc disposed in the casing, the record disc having a recorded face with starting and end points of sound reproduction;

a thrust holder formed in the casing;

a center shaft movably held by the thrust holder and capable of advancing and retracting along its longitudinal axis;

means for normally biasing the center shaft toward its direction of retraction;

the record disc being rotatably supported by the center shaft;

a tone arm having forward and rearward ends, the tone arm being swingably supported at the rearward end on the casing;

return spring means mounted on the casing for normally biasing the tone arm away from the recorded face of the record disc and toward the starting point of sound reproduction;

a pickup carried on the forward end of the tone arm, the pickup being positioned for engagement with the recorded face of the record disc and capable of being swung between the starting and end points of sound reproduction;

a sound transmitting member slidably engageable with the pickup;

a speaker carried by the sound transmitting member;

a stylus force spring acting on the sound transmitting member for urging the sound transmitting member and the pickup engaged therewith into engagement with the recorded face of the record disc with predetermined stylus force;

a stopper member rotatable with the record disc, the stopper member being located adjacent to the face of the record disc opposite from the recorded face;

a plurality of locking bars, each independently manipulatable from outside of the casing, the locking bars being arranged in a circle about the center shaft and being capable of advancing into the plane of rotation of and engaging the stopper member so as to cause the stopper member to temporarily stop rotation of the record disc and retracting from the stopper member to permit rotation of the record disc;

means for biasing the locking bars toward a retracted position;

each locking bar having a projection formed thereon;

a manipulating member radially extending from and fixed to the center shaft; the manipulating member being engageable with the projections on the locking bars so as to be movable with advancing of the locking bars, the manipulating member, upon movement, causing advancing of the center shaft;

one end of the center shaft being engageable with the sound transmitting member upon advancing such that the sound transmitting member advances away from the recorded face of the record disc to release stylus force from the pickup;

an electric switch switchable to a closed state as the pickup moves away from the end point of sound reproduction;

an electric motor for rotating the record disc, the electric motor being connectable to a power source through the electric switch;

the electric motor having an output shaft; and

frictional engagement means for connecting the output shaft of the motor to the record disc.

4,404,669

STYLUS ASSEMBLY

Michael E. Miller, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 20, 1982, Ser. No. 341,144
Int. Cl.[3] G11B *9/06*, *3/46*
U.S. Cl. 369—170 **11 Claims**

1. An assembly for use in a player apparatus for recovering signal from a high density disc record, said assembly comprising:

a longitudinal stylus arm of relatively low mass;

a stylus holder secured to a first end of said stylus arm;

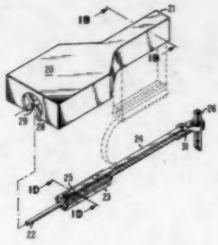
a stylus including a conductive electrode, said stylus being secured in said stylus holder;

a conductive leaf spring having a first end connected for making electrical connection to said electrode and fixedly secured proximate the first end of said stylus arm wherein

the length of said leaf spring is arranged to lie proximate and parallel to said stylus arm;

a terminal element releasably secured to said stylus arm and positioned proximate a second end of said leaf spring; and

means for securing the second end of said leaf spring to said terminal element;



wherein said terminal element serves to hold the leaf spring in fixed relation to the stylus arm and is adapted to be detached from the stylus arm and attached to a predetermined location in said player apparatus to position the second end of said leaf spring in said predetermined location.

4,404,670

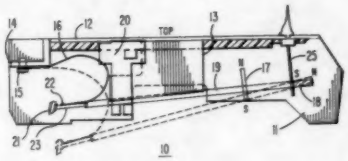
PICKUP ARM RETAINER FOR VIDEO DISC CARTRIDGE

Byron K. Taylor, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,392

Int. Cl.³ G11B *1/00*

U.S. Cl. 369—170 **9 Claims**



9. A cartridge for supporting a signal pickup stylus fixed to a first end of a stylus arm a second end of which is compliantly secured in said cartridge comprising:

a cartridge body having sidewalls spaced apart by a topwall defining a protective enclosure;

a generally flat support element having a top edge fixed to an inside surface of said topwall, said support element having a bottom edge configured to receive said stylus arm thereon; and

a retainer formed from resilient material for holding the stylus arm to the bottom edge of said support element, said retainer including;

a. a body element having first and second sidewalls spaced apart by a third sidewall each of said sidewalls having top and bottom edges;

b. first and second extensions, extending from the top edges of the first and second sidewalls respectively and angled to converge on each other, a portion of each extension crossing a plane substantially midway between the sidewalls; and

c. first and second spring tabs separated by a distance less than the thickness of said cartridge topwall arranged near the bottom edge of each of said first and second retainer sidewalls; wherein said retainer is inserted through an aperture in the cartridge top wall with said first and second extensions straddling the support member and converging to encompass said stylus arm thereon, and wherein the respective first and second spring tabs engage opposite surfaces of the cartridge top wall securing the retainer thereto.

4,404,671

LINEAR DRIVE MOTOR CONTROL SYSTEM

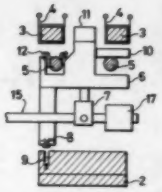
Hiroshi Kuribayashi, and Atsuo Ikeda, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation

Continuation of Ser. No. 30,981, Apr. 18, 1979, abandoned. This application Nov. 25, 1980, Ser. No. 210,185

Claims priority, application Japan, Apr. 20, 1978, 53-46798

Int. Cl.³ G11B *17/02*

U.S. Cl. 369—216 **6 Claims**



1. A drive control device for use in a linear motor having a stator and a sliding member capable of sliding along said stator comprising:

a tone arm assembly coupled to said sliding member;

means for detecting the position of said sliding member relative to said stator and producing an electrical position signal representative of displacement of said member from a reference position on said stator, said detecting means comprising at least one of a predetermined one of a light emitting element and a light detecting element arranged on said sliding member and at least one of the other one of said light emitting element and light detecting element being provided at at least one stationary reference position, said position signal being produced at an output of said light detecting element;

signal producing means for producing a reference electrical signal, a magnitude of said reference signal being an average of a maximum level and a minimum level of said position signal over all positions of said sliding member along said stator;

means for comparing said position signal with said reference signal to produce an output signal; and

means for controlling driving of said linear motor in response to said output signal to stop sliding movement of said sliding member when said reference signal exceeds said position signal.

4,404,672

SUBSCRIBER TERMINAL FOR USE IN A TIME SHARED BIDIRECTIONAL DIGITAL COMMUNICATION NETWORK

Hiroshi Shimizu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,281

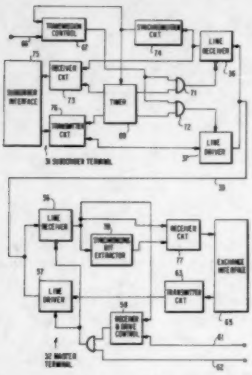
Claims priority, application Japan, Mar. 28, 1980, 55-40901; May 8, 1980, 55-60911; May 9, 1980, 55-61431

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—29 **17 Claims**

1. A subscriber terminal for use in a bidirectional communication network in which said subscriber terminal is connected to a master terminal through a communication channel and in which said subscriber terminal receives a receive signal composed of a plurality of digital receive signal bursts from said

master terminal through said channel and sends a digital send signal burst to said master terminal through said channel on a time shared basis in each frame period to carry out communication with said master terminal in a communication interval following a call originating interval, said subscriber terminal comprising first means capable of being put once in each frame period in a first mode of producing digital receive signals with a first frame phase in response to the receive signal bursts received through said channel, second means capable of being put once in each frame period in a second mode of supplying digital send signals with a second frame phase to said channel as the send signal bursts, third means responsive to said receive signals for putting said first and said second means in said first mode and out of said second mode, respectively, and then out of said first mode and in said second mode, respectively, in each frame period to synchronize said second frame phase with said first frame phase, means responsive to said receive and said



send signals for carrying out said communication, and means for producing a call originating signal in said call originating interval, wherein the improvement comprises means responsive to said call originating signal for activating said third means to cause said third means to put said first and said second means temporarily out of said first mode and in said second mode, respectively, and then in said first mode and out of said second mode respectively, repeatedly until said call originating interval is followed by said communication interval, said second means supplying said call originating signal to said channel while being temporarily put in said second mode, said first means producing, while being continuously put in said first mode after being temporarily put out of said first mode, a digital receive signal with said first frame phase in response to each digital receive signal burst supplied to said channel by said master terminal in response to the call originating signal arriving thereat through said channel.

4,404,673

ERROR CORRECTING NETWORK

Roy K. Yamanouchi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 9, 1981, Ser. No. 232,786

Int. Cl.[3] G06F *11/10*; G11C *29/00*

U.S. Cl. 371—13 **8 Claims**

1. A method for verifying the integrity of error correction of digital data and associated parity bits read from a digital storage system comprising the steps of:

reading the stored digital data and the associated parity bits;

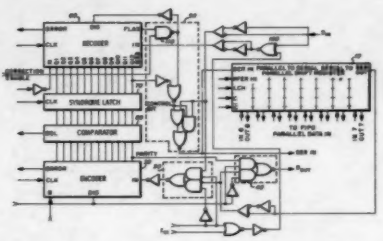
detecting a parity error in the digital data and the associated parity bits;

generating an error syndrome associated with the digital data, the associated parity bits and the location of the parity error;

storing the error syndrome;

rereading the stored digital data and the associated parity bits;

correcting the reread digital data in response to the error syndrome;



generating a reread error syndrome associated with the reread digital data, the associated parity bits and the location of any errors occurring during the reread step; and

comparing the stored error syndrome and the reread error syndrome.

4,404,674

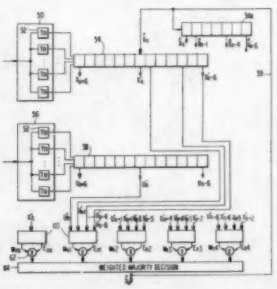
METHOD AND APPARATUS FOR WEIGHTED MAJORITY DECODING OF FEC CODES USING SOFT DETECTION

Smith A. Rhodes, Falls Church, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jul. 10, 1981, Ser. No. 282,319

Int. Cl.[3] G06F *11/10*

U.S. Cl. 371—43 **26 Claims**



1. A method of weighted majority decoding of code symbol signals included in a forward error correcting (FEC) code, said code symbol signals including information symbol signals representing information symbols having at least first and second code values and parity symbol signals representing parity symbols generated from selected combinations of said information symbols, said method comprising the steps of:

receiving information symbol signals representing the code values of said information symbols,

receiving parity symbol signals representing the values of said parity symbols;

soft detecting said information symbol signals to detect the voltage of each information symbol signal;

generating a code value signal indicating the code value represented by each said information symbol signal;

generating an information symbol reliability signal representing the reliability of each said code value signal;

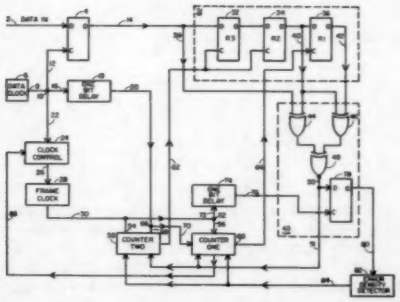
detecting said parity symbol signals and generating a parity

value signal corresponding to the detected value of each parity symbol;
generating a first estimate of the code value of a particular information symbol from the code value signal corresponding to that symbol;
assigning to said first estimate a symbol weighting factor in accordance with the information symbol reliability signal corresponding to the detected information symbol signal for said particular information symbol;
combining selected ones of said code and parity value signals to obtain at least one further estimate of the code value of said particular information symbol;
assigning to said at least one further estimate a fixed symbol weighting factor;
combining corresponding estimate weighting factors and code value estimates to obtain weighted estimates;
combining said weighted estimates to obtain a combined weighted estimate; and
providing a decoded symbol in accordance with the value of said combined weighted estimate.

4,404,675
FRAME DETECTION AND SYNCHRONIZATION SYSTEM FOR HIGH SPEED DIGITAL TRANSMISSION SYSTEMS

Robert A. Karchevski, San Mateo, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Apr. 27, 1981, Ser. No. 258,192
Int. Cl.³ H04J 3/06
U.S. Cl. 371—47 3 Claims

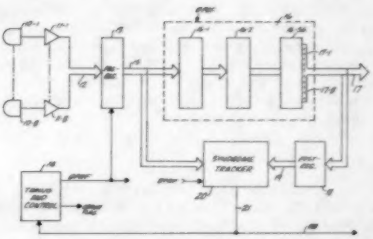


1. In a high speed digital system, a framing detector and frame synchronization arrangement for a framing pattern other than that of a winking framing pattern consisting of alternating binary "1"s and "0"s, comprising:
a preview store having a plurality of stages each capable of storing a like number of bits;
timing means synchronized with the incoming binary data for clocking into each stage of said preview store said like number of bits, on the occurrence of each framing bit;
a comparator for comparing the state of the present incoming data bit with stored outputs from selected stages of said preview store to determine if these bits constitute a valid framing sequence, and providing a binary output of one state for a valid sequence and of the other state otherwise;
an error density detector for providing an error signal indication when a predetermined error rate is exceeded; and
counting means adapted to be responsive both to the output signal from said error density detector and to the output signal from said comparator so as to permit either the clocking in of said like number of bits whenever the comparator output indicates that a valid framing sequence exists at a frame interval, or to permit a bit by bit comparison as the bits stored in the preview store are stepped one bit at a time for valid framing sequence comparison, the stepping sequence being stopped by the occurrence of a valid frame sequence as determined by the output of said comparator, or by stepping through said like number of bits, whichever occurs first; should the latter occur, the timing means reads into said preview store a like number of bits for comparison with the bit at the next frame bit location.

4,404,676
PARTITIONING METHOD AND APPARATUS USING DATA-DEPENDENT BOUNDARY-MARKING CODE WORDS

Erik P. DeBenedictis, Pasadena, Calif., assignor to Pioneer Electric Corporation, Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,907
Int. Cl.³ H04L 17/00; G06F 11/10
U.S. Cl. 371—47 12 Claims

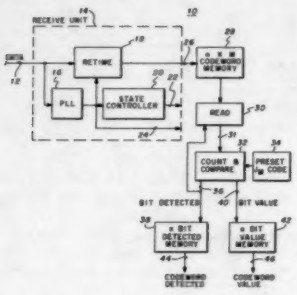


1. A process for decoding a data signal defining information, including data bits and redundancy bits, at spaced points in time, the data signal being characterized by a tolerance with respect to the points in time at which it defines the information, and being further characterized in that the data bits represent a plurality of blocks and the redundancy bits represent a plurality of data-dependent code words, each such code word bearing a predetermined mapping relationship to a respective one of the blocks and otherwise being indistinguishable from any arbitrarily selected groups of data bits, the process comprising the steps of:
(a) forming a plurality of individually identifiable clock signals, each such clock signal having reoccurring clock pulses therein, the clock pulses of each such clock signal differing from those of each other clock signal as to time of occurrence;
(b) sampling the data signal upon occurrence of the clock pulses to derive a plurality of sample bits;
(c) congregating a multiplicity of groups of sample bits as candidate cells, each such candidate cell including a block-length portion and a code-word-length portion with all sample bits of both portions being derived from the same clock signal;
(d) testing each of the multiplicity of candidate cells to determine, as each candidate cell undergoes testing, whether its code-word-length portion bears the predetermined mapping relationship to its block-length portion as is characteristic of a valid cell; and
(e) generating a candidate-valid signal for each candidate cell that upon testing is determined to be a valid cell.

4,404,677
DETECTING REDUNDANT DIGITAL CODEWORDS USING A VARIABLE CRITERION

Johannes Grande, Richardson, and James H. Brown, Garland, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 8, 1981, Ser. No. 252,093
Int. Cl.³ G06F *11/08, 7/02*
U.S. Cl. 371—69 **18 Claims**

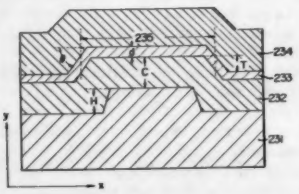


1. A method for detecting redundant digital codewords repeatedly transmitted over a digital transmission system, comprising checking the values of bits in corresponding bit-positions for a varying number of m of consecutive n bit codewords, and comparing to determine, for each bit-position, when a count of bits having equal values reaches a varying threshold j_m dependent upon m, thereby affording fast detection under low error conditions.

4,404,678
SEMICONDUCTOR LASER DEVICE

Kunio Aiki, Hachioji; Michiharu Nakamura, Nishitama, and Jun-ichi Umeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 786,758, Apr. 12, 1977, Pat. No. 4,326,176. This application Apr. 5, 1982, Ser. No. 365,606
Claims priority, application Japan, Apr. 16, 1976, 51-42469; May 26, 1976, 51-60009; Jan. 24, 1977, 52-5944; Jan. 24, 1977, 52-5945; Jan. 24, 1977, 52-5946; Mar. 9, 1977, 52-24806; Mar. 9, 1977, 52-24807
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **10 Claims**



1. In a semiconductor laser device comprising a semiconductor body of a first conductivity type having a major surface and a plurality of contiguous semiconductor layers disposed on said major surface of said body, said plurality of contiguous semiconductor layers being comprised of:

(i) a first semiconductor layer having a laser active region, a pair of end surfaces parallel to each other so as to form a cavity resonator, and two opposite plane surfaces, a first surface of which faces towards said major surface of said body and second surface of which faces away from said major surface of said body,

(ii) a second semiconductor layer disposed on said first surface, comprised of a material having a band gap broader than that of said first semiconductor layer,

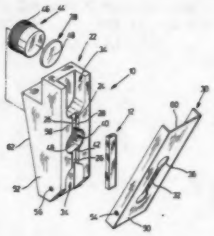
(iii) a third semiconductor layer disposed on said second surface disposed on said second surface comprised of a material having a band gap broader than that of said first semiconductor layer,

wherein said second and third semiconductor layers have a thickness larger than a distance r in which an evanescent wave along said first surface decays by 1/e, and further wherein said second semiconductor layer has a protrusive portion jutting out toward said first semiconductor layer, said first semiconductor layer covering said second semiconductor layer is protruberant along said protrusive portion of said second semiconductor layer, and said third semiconductor layer covering said first semiconductor layer is protuberant along the protrusive portion of said first semiconductor layer.

4,404,679
DYE CELL HOLDER FOR DYE LASER

Pay H. Chiu, and Andre J. Desroziers, both of London, Canada, assignors to Photochemical Research Associates Inc., London, Canada

Filed Jun. 11, 1981, Ser. No. 272,712
Int. Cl.³ H01S *3/20*
U.S. Cl. 372—54 **11 Claims**



1. In combination, a dye cell holder and a receptable therefor for use in a dye laser arrangement, said dye cell holder comprising means for supporting a thin fragile dye cell and means for retaining such dye cell against said supporting means, said retaining means having an aperture provided therein to permit an incoming laser beam to pump a dye solution in such dye cell, said support means and retaining means forming a wedge-shaped unit whereby said support means has a front face to support such dye cell and a rear face, said support front and rear faces converging to provide in conjunction with said retaining means the wedge-shaped unit having a narrower lower portion, said retaining means and support means being pivotally connected together about an axis at the narrower portion of said support means with said axis extending in a direction essentially parallel to the front face of said support means, said receptacle having a cooperating wedge-shaped receiving area with opposing surfaces for engaging the support rear face and the retaining means when said unit is placed in said receptacle for moving said support means and retaining means together to squeeze lightly and thereby hold such dye cell in said holder, said receptacle being provided with an aperture aligned with said aperture in said retaining means.

4,404,680
DIGITAL PHASE SYNCHRONIZER

Derrick O. Perkins, Raleigh, N.C., assignor to Telex Computer Products, Inc., Raleigh, N.C.

Filed Nov. 3, 1980, Ser. No. 203,457
Int. Cl.³ H04L *7/02*
U.S. Cl. 375—111 **9 Claims**

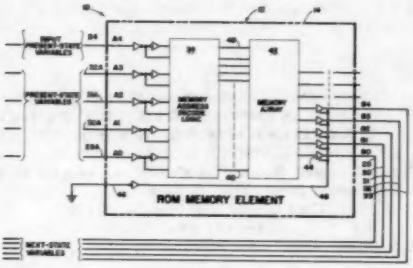
1. Apparatus for synchronizing a clock recovery signal to an

incoming phase-varying digital signal (input signal), comprising;

(a) state clock means to provide a bilevel signal of frequency N times the nominal frequency of said incoming signal where N is a selected even number;

(b) memory means having a selected number of independently addressable addresses in which are stored corresponding selected different binary numbers each having a selected number M of binary bits; and M output leads equal in number to the number of bits in each stored word;

(c) state latch means comprising M latch means responsive to said state clock for temporary storage of binary bits, said state latch means having at least M separate inputs to one of which each of the M output leads from said memory are connected; and means to set each of said M latch means on the rising transition of each cycle of said state clock;



(d) received data latch and means to set said received data latch on the falling transition of each cycle of said state clock for sampling said input signal;

(e) a selected number, say (M−Y) of the outputs of said M latches in said state latch means connected to M−Y input leads of said memory, the Yth output of said M latches carrying the output signal of said apparatus, where Y is the number of input and output signals;

(f) the output of said received data latch connected to the Yth input lead to said memory means, each of the M input signals comprising M bits of a binary word defining the address of a selected storage location in said memory;

whereby, dependent upon the particular polarities of the M input leads to said memory means, selected ones of the memory locations are determined and the M bit words stored therein are impressed on the M output leads, M−Y of which and the input signal are connected to the inputs of said state latch means, which are latched into said memory means on the next cycle of said state clock.

4,404,681

DEVICE FOR SETTING A SIGNAL PROCESSING CIRCUIT

Josef Hüllwegen, Altenbeken, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Fed. Rep. of Germany

Filed Nov. 7, 1980, Ser. No. 205,038

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945331

Int. Cl.³ H04B *3/06*

U.S. Cl. 375—102 **3 Claims**

1. A system for setting a signal processing circuit to an optimum response condition comprising:

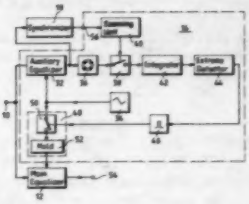
means (10) for receiving a transmitted data signal;

a main signal processor (12) having an input connected to means (10) for receiving the transmitted signal and having a regulable response characteristic;

an auxiliary signal processor (32) having an input also connected to said means (10) for receiving the transmitted data signal and also having a regulable response characteristic equal to that of the main signal processor (42);

means (34) having a control output quantity connected to the auxiliary signal processor (32) for varying the regulable response characteristic thereof over a predetermined range which includes at least one optimum response condition;

means (36, 38, 42, 44, 46) connected to the auxiliary signal processor for detecting the optimum response condition in the output thereof and for generating a signal when said condition occurs;



holding means (50, 52) connected to for varying (34) and to said means for receiving (36, 38, 42, 44, 46) for receiving and holding the control output quantity of means (34) on occurrence of the signal from means (36, 38, 42, 44, 46); and

said holding means (52) being connected to the main signal processor (32) to regulate the regulable response characteristic thereof to equal the response characteristic of the auxiliary signal processor (32) at which the optimum response condition occurred.

4,404,682

METHOD FOR FORESEEING RESIDUAL LIFE OF STRUCTURAL MEMBER MAKING USE OF X-RAY

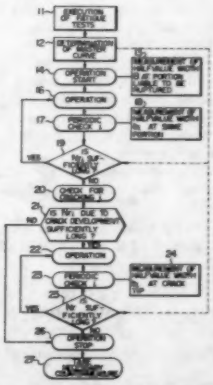
Makoto Hayashi, and Tasuku Shimizu, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1980, Ser. No. 217,083

Claims priority, application Japan, Dec. 19, 1979, 54/165246

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—72 **6 Claims**



1. A method for determining the residual life of a structural member composed of a metal or alloy, making use of an X-ray, comprising:

preparing a plurality of test pieces made of the same material and subjected to the same working and heat-treating con-

ditions as the structural member to be examined of which the fatigue strength is in question;

executing fatigue tests with said test pieces till failure under a plurality of different stress conditions above the fatigue limit;

obtaining for each stress condition the relationship between the residual life of said test piece and the halfvalue width ratio of the X-ray diffraction profile;

determining, from the above-mentioned relationships, a substantially common relationship interval between the residual life and the halfvalue width ratio in the region of short residual life that is, therefore, independent of the stress conditions;

measuring said halfvalue width ratio of said structural member; and

determining the residual life of said structural member from the measured halfvalue width ratio in accordance with said common relationship interval.

4,404,683

BLOOD CELL IDENTIFICATION AND CLASSIFICATION SYSTEM

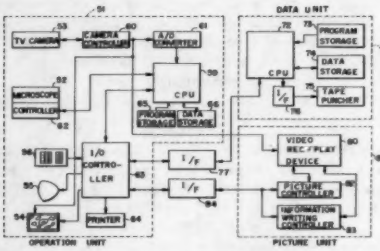
Shigeki Kobayashi, Otsu; Norio Iwasaki, Ichikawa; Yasunori Ikeda, Kameoka; Tamio Miyake, and Shigeru Tanimura, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 10, 1980, Ser. No. 195,869

Claims priority, application Japan, Oct. 24, 1979, 54-138156

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—6 **5 Claims**



1. A blood cell identification and classification system having a photographing means for producing magnified images of cells in blood smears and generating video signals and an automatic analytical means for analyzing cells based on said video signals, characterized in that said system comprises:

a video recording means for recording on a collective basis the magnified images of unknown cells which could not be identified by said automatic analytical means in conjunction with identification data for smears to which said unknown cells pertain,

a video reproduction means for reproducing the magnified images of unknown cells and identification data so recorded, and

an input means for entering analytical data derived from the magnified images of unknown cells so reproduced.

4,404,684

OBJECT SOLID FIGURE RECOGNIZING METHOD AND APPARATUS

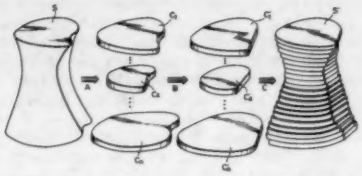
Munekazu Takada, Uji, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Jul. 31, 1980, Ser. No. 174,060

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—25 **11 Claims**

1. A method for recognizing the shape of a three dimensional object comprising the steps of: rotating a hollow cylindrical rotary unit having an internal photoelectric sensor having a light source section and a light receiving section confronting with said light source section; moving an object through the hollow part of said cylindrical rotary unit on a transparent conveying means; applying light from said light source section



to said object to detect an actual projection pattern of said object; and analyzing an actual projection spectra forming said actual projection pattern by a computer to recognize the shape of said object.

4,404,685

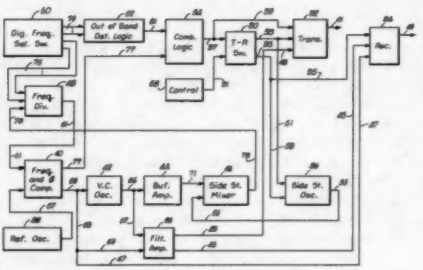
FREQUENCY CONTROL SYSTEM FOR RADIO APPARATUS EMPLOYING FILTER AMPLIFIER OPERATED AT HARMONIC OF FREQUENCY OF SYNTHESIZED SIGNAL SOURCE

Noel A. Rogers, Shawnee Mission, Kans., assignor to Terra Corporation, Albuquerque, N. Mex.

Filed Oct. 26, 1981, Ser. No. 314,717

Int. Cl.³ H04B *1/40*

U.S. Cl. 455—76 **7 Claims**



1. In radio apparatus having—

radio signal handling means adapted to have a frequency controlling signal applied thereto and operative to transmit or/and receive radio signals of selected frequency determined by and correlated in predetermined manner with the frequency of said frequency controlling signal,

signal comparator means adapted to have a reference frequency signal of predetermined frequency and a comparable frequency signal applied thereto and operative to provide a signal of variable electrical, magnitude determined by and correlated in predetermined manner with the relationship between the frequencies of said reference frequency signal and said comparable frequency signal,

reference signal producing means operative to provide said reference frequency signal and coupled with said comparator means for applying said reference frequency signal to said comparator means,

frequency divider means adapted to have a digitally encoded control signal and a synchronization frequency signal applied thereto, operative to provide said comparable signal with the latter having a frequency equal to the frequency of said synchronization frequency signal divided by a numeric factor determined by said encoded control signal, and coupled with said comparator means

for applying said comparable signal to said comparator means,

frequency selecting means having a plurality of selectable conditions, operative to provide said encoded control signal in accordance with a selected condition of said selecting means, and coupled with said divider means for applying said encoded signal to said divider means,

variable frequency signal producing means adapted to have said variable magnitude signal applied thereto and coupled with said comparator means for that purpose, and operative to provide a tunable frequency signal having a frequency determined by and correlated in predetermined manner with the magnitude of said variable magnitude signal, and

loop path means adapted to have said tunable frequency signal applied thereto and coupled with said variable frequency signal producing means for that purpose, operative to provide said synchronization frequency signal, and coupled with said divider means for applying said synchronization frequency signal to said divider means,

the improvement of which comprises the provision, in combination with the aforesaid, of:

signal processing means, including filter amplifier means having frequency selective tank circuits tuned to a frequency equal to an harmonic of the frequency of said tunable frequency signal, coupled with said variable frequency signal producing means and said comparator means for respectively receiving said tunable frequency signal and said variable magnitude signal to produce said frequency controlling signal with the latter having a frequency equal to an harmonic of said tunable frequency signal, and coupled with said signal handling means for applying said frequency controlling signal to said signal handling means,

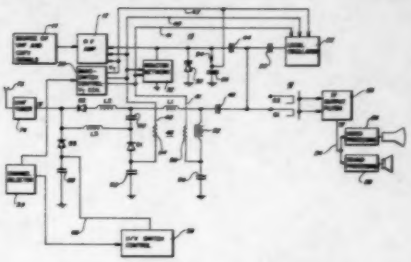
whereby said signal handling means may be operated at a relatively high selected frequency, while said comparator means, said reference signal producing means, said frequency divider means, said variable frequency signal producing means and said loop path means are being operated at substantially lower frequencies.

4,404,686

FOUR BAND VHF VARACTOR TUNER TO COVER EXTENDED CATV BAND UTILIZING TWO SWITCHING DIODES PER RESONANT CIRCUIT

Frederick H. Moon, Mt. Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 1, 1980, Ser. No. 211,494
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—191 **4 Claims**



1. In a television receiver tuner operable for tuning a plurality of television signal bands, the improved apparatus comprising:

bandswitch means having a plurality of output conductors for developing a different set of bandswitch control signals defining each of said television signal bands;

a tuned circuit including a first band-switchable inductive network and a varactor diode, said first band-switchable inductive network being responsive to said bandswitch control signals for assuming a different effective inductance for tuning each of said television signal bands;

a mixer transistor having an input electrode;

capacitance means coupled in series between said input electrode and said tuned circuit; and

a second band-switchable inductive network coupled to said input electrode and responsive to said bandswitch control signals for connecting a different value of effective inductance in shunt with said input electrode for each of said television signal bands, each of said different values of inductance of said second inductive network providing, in association with said capacitance means, a resonant frequency below the lowest channel frequency of the corresponding one of said plurality of television signal bands

for matching the impedance coupled to said input electrode with the impedance of said mixer transistor at said input electrode at the low end of the respective television signal band.

DESIGN PATENTS

GRANTED SEP. 13, 1983

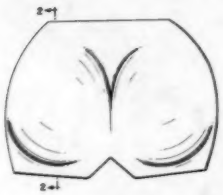
ERRATA

For CLASS	See PATENT NO.
D06–031	270,540
D07–020	270,544

DESIGNS

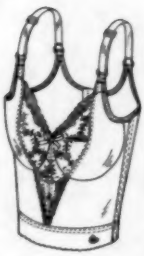
SEPTEMBER 13, 1983

270,489
FIGURE ENHANCER
Adriana M. Camus, Avenida El Bosque 3583, Santiago, Chile
Filed May 13, 1980, Ser. No. 149,512
Claims priority, application Chile, Dec. 28, 1979, 876
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—1



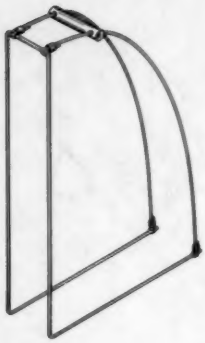
270,490
BRASSIERE
Rosalie Novitsky, Howard Beach, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jul. 9, 1981, Ser. No. 281,580
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

270,491
BRASSIERE
Rosalie Novitsky, Howard Beach, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Jul. 9, 1981, Ser. No. 281,673
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



270,492
Patent Not Issued For This Number

270,493
FIREWOOD CARRIER
Clarence A. Ose, Rte. 1, Box 160, Echo, Minn. 56237
Filed Feb. 2, 1981, Ser. No. 230,424
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D3—30.1



270,494
VIDEO RECORDER CASE
Andre Koszegi, South Bend, Ind., assignor to Koszegi Leather & Vinyl Products, Inc., S. Bend, Ind.
Filed Mar. 9, 1981, Ser. No. 242,026
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—33

270,495
PORTABLE SKI CARRIER
Michael D. Owings, Lake Oswego, Oreg., assignor to Sun International Ski Products, Inc., Wilsonville, Oreg.
Filed Aug. 6, 1981, Ser. No. 290,428
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—36

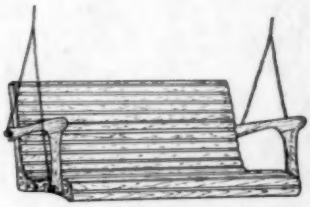
270,496
HANDBAG
Delores M. Hyers, 5417 Cary Street Rd., Richmond, Va. 23226
Continuation-in-part of Ser. No. 122,677, Feb. 19, 1980, Pat. No. Des. 262,587. This application Feb. 27, 1981, Ser. No. 239,149
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—50

270,497
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,374
Claims priority, application Switzerland, Sep. 10, 1979, DMA000007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—30

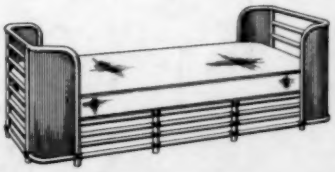
270,498
COVER FOR INFANT CAR SEAT
Bernard R. Schutz, New York, N.Y., assignor to Fine Art Pillow & Specialties Corp., New York, N.Y.
Filed Jun. 10, 1981, Ser. No. 272,318
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—48

270,499
ROCKING CHAIR
Walter F. Harper, Jr., and Thomas W. Winecoff, both of P.O. Box 147, Eagle Springs, N.C. 27242
Filed Jul. 6, 1981, Ser. No. 280,452
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49

270,500
SWING
Walter F. Harper, Jr., and Thomas W. Winecoff, both of P.O. Box 147, Eagle Springs, N.C. 27242
Filed Jul. 6, 1981, Ser. No. 280,451
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—54

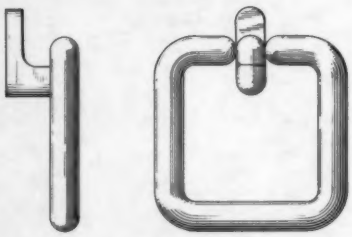


270,501
LOUNGE
Henry Olko, Chicken Valley Rd., Locust Valley, N.Y. 11650
Filed Oct. 23, 1980, Ser. No. 199,859
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57

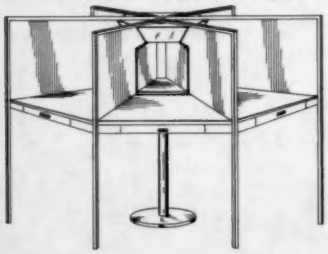


270,502
CHAIR OR THE LIKE
Hector M. Coronado, 2209 Via Cerritos, Palos Verdes Estates, Calif. 90274
Filed Jun. 4, 1981, Ser. No. 270,266
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

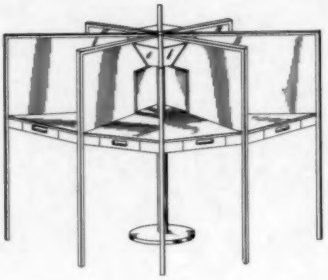
270,503
RING FOR TOWELS
Piet Cohen, Amsterdam, Netherlands, assignor to Materias Plasticas, Limitada, Leiria, Portugal
Filed Nov. 4, 1980, Ser. No. 204,062
Claims priority, application Portugal, May 9, 1980, 15.088
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



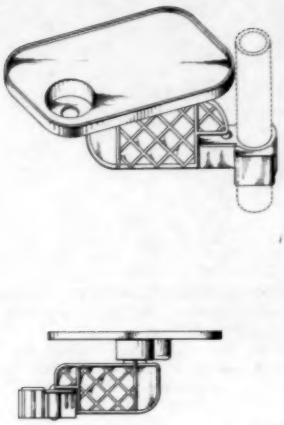
270,504
MULTIPLE DESK UNIT
Devere P. Kent, 5720 S. Jordan Canal Rd., Salt Lake City, Utah 84118
Filed Jul. 28, 1980, Ser. No. 172,890
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—146



270,505
MULTIPLE DESK UNIT
Devere P. Kent, 5720 S. Jordan Canal Rd., Salt Lake City, Utah 84118
Filed Aug. 1, 1980, Ser. No. 174,382
The portion of the term of this patent subsequent to Sep. 13, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—146



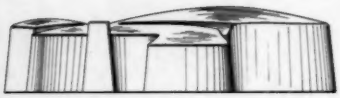
270,506
ROTATABLE TRAY AND SUPPORT
George W. Thorne, 2625 Sea Island, Fort Lauderdale, Fla. 33301
Filed Apr. 13, 1981, Ser. No. 253,792
Term of patent 14 years
Int. Cl. D06—*06*; D07—*99*
U.S. Cl. D6—199



270,507
CUP OR SIMLAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 140,180, Apr. 14, 1980, Pat. No. Des. 267,697. This application Apr. 26, 1982, Ser. No. 371,936
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

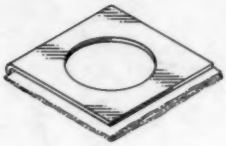
270,508
COVERED PEDESTAL JAR OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 140,180, Apr. 14, 1980, Pat. No. Des. 267,697. This application May 10, 1982, Ser. No. 376,753
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17

270,509
FOOD MOLD
David W. Miller, Salem, Mass., assignor to Benjamin & Medwin, Inc., New York, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,868
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—43



270,510
FOOD MOLD
David W. Miller, Salem, Mass., assignor to Benjamin & Medwin, Inc., New York, N.Y.
Filed Apr. 1, 1981, Ser. No. 249,870
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—44

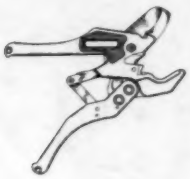
270,511
COASTER
Maxine C. Friedman, Atlanta, Ga., assignor to PCC Enterprises, Inc., Atlanta, Ga.
Filed Nov. 17, 1980, Ser. No. 207,121
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—45



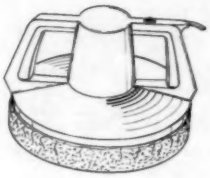
270,512
CONDIMENT SHAKER OR SIMILAR ARTICLE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 140,180, Apr. 14, 1980, Pat. No. Des. 267,697. This application May 21, 1982, Ser. No. 380,607
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—54

270,513
DISPOSABLE COFFEE FILTER OR THE LIKE
Hans I. Wallsten, Chemin di la Lisiére 6, CH-1018 Lausanne, Switzerland
Filed Aug. 5, 1980, Ser. No. 175,575
Claims priority, application Sweden, Feb. 6, 1980, 80-0261
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—400

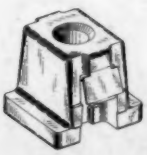
270,514
PIPE CUTTER
Osamu Muromoto, Neyagawa, Japan, assignor to Muromoto Tekko Kabushiki Kaisha, Japan
Filed Oct. 7, 1980, Ser. No. 194,912
Claims priority, application Japan, May 29, 1980, 55-21274
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—60



270,515
POLISHER
Jerald V. Dunlap, Pacific Palisades, Calif., assignor to M-D & Co., Mammoth Lakes, Calif.
Filed Aug. 25, 1980, Ser. No. 180,889
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—67



270,516
REVERSE SCREW GROMMET
Jean R. Achille, Forest Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jan. 2, 1981, Ser. No. 221,957
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354



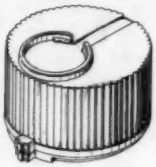
270,517
AMBIDEXTROUS OPERATIVE CLAMP FOR DENTAL IMPRESSION TUBES
Paul D. Raskin, 1600 39th St., Sacramento, Calif. 95816
Filed May 4, 1981, Ser. No. 260,058
Term of patent 14 years
Int. Cl. D8—*08*; D24—*99*
U.S. Cl. D8—396

270,518
BOTTLE
Walter Duering, Zurich, Switzerland, assignor to Düring AG, Daellikon, Switzerland
Filed Jul. 31, 1981, Ser. No. 288,986
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—317

270,519
BOTTLE
John F. Post, 446 Oakdale Rd., Chester, N.J. 07930
Filed Apr. 1, 1981, Ser. No. 249,968
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—341

270,520
BOTTLE
Gordon A. Strand, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Jun. 15, 1981, Ser. No. 273,701
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

270,521
CHILD RESISTANT PUSH BUTTON CAP FOR CONTAINERS
Glenn H. Morris, 4203 Highwood Dr., Chattanooga, Tenn. 37415
Continuation-in-part of Ser. No. 169,881, Jul. 17, 1980. This application May 29, 1981, Ser. No. 268,171
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—443

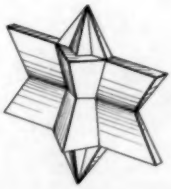


270,522
DIGITAL ALARM CLOCK
William J. Cook, Trumbull, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Aug. 28, 1981, Ser. No. 297,373
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

270,523
WALL CLOCK
Dana W. Mox, Elk Grove Village, Ill., assignor to Tricolor Corporation, Las Cruces, N. Mex.
Filed Jul. 28, 1980, Ser. No. 173,681
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—22

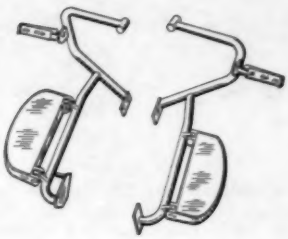
270,524
WEATHER INDICATING INSTRUMENT
Theodore S. Sloane, Palm Beach, Fla., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Jun. 8, 1981, Ser. No. 271,423
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53

270,525
STAR OF DAVID ORNAMENT
Charles M. Bayusik, 29 Mohawk Dr., Easton, Conn. 06612
Filed Jun. 4, 1981, Ser. No. 270,638
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—125



270,526
LIGHT ARMOURED VEHICLE
Paul Legueu, 85 avenue de Mazy, 44380 Pornichet, France
Filed Sep. 25, 1980, Ser. No. 190,838
Claims priority, application France, Apr. 15, 1980, 801247
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

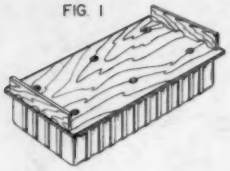
270,527
PAIR OF COMBINED SAFETY BAR AND FOOT RESTS FOR A MOTOR CYCLE
James O'Rourke, Unit 4, 8131 Keele St., Concord, Ontario, Canada (L4K 1C3)
Filed Aug. 18, 1981, Ser. No. 293,796
Claims priority, application Canada, Mar. 20, 1981, 20-03-81-1
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



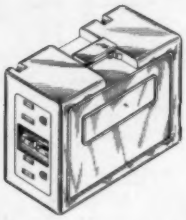
270,528
HOLDER FOR MATERIAL USED IN THE REPAIR OF AUTOMOTIVE VEHICLE BODIES
Thomas N. Bloomquist, Rte. 2, Harris, Minn. 55033
Filed May 26, 1981, Ser. No. 266,751
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

270,529
FLOAT APPARATUS FOR DOCKS AND THE LIKE
Thomas L. Thompson, 1645 Monrovia Ave., Costa Mesa, Calif. 92627
Filed Aug. 22, 1980, Ser. No. 180,498
Term of patent 14 years
Int. Cl. D12—*99*; D21—*99*
U.S. Cl. D12—316

FIG. 1

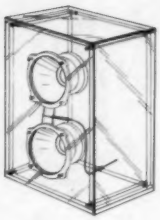


270,530
PORTABLE GROUND FAULT CIRCUIT INTERRUPTER
Wade R. Bowden, Jr., Northport, and George C. Hoehne, Glen Cove, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.
Filed Mar. 13, 1981, Ser. No. 243,563
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

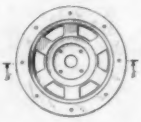


270,531
DECODER FOR A DIGITAL AUDIO DISCS PLAYER
Kenji Ekuan, Tokyo, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan
Filed May 12, 1981, Ser. No. 262,983
Claims priority, application Japan, Nov. 13, 1980, 55-47435
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—1

270,532
SPEAKER CABINET
Lee A. Weinstein, 6333 Calvert St., Philadelphia, Pa. 19149
Filed Aug. 22, 1980, Ser. No. 180,531
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34

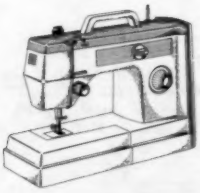


270,533
LOUDSPEAKER BASKET
William Piercy, Wilcox, Ariz., assignor to Tru-Die, Inc., Franklin Park, Ill.
Filed May 11, 1981, Ser. No. 262,438
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—37

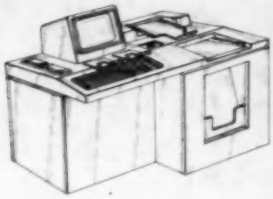


270,534
CORDLESS TELEPHONE
Richard E. Bloem, Sr., Arcadia, Calif., assignor to American Telecommunications Corporation, El Monte, Calif.
Filed Mar. 23, 1981, Ser. No. 246,432
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

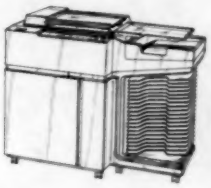
270,535
SEWING MACHINE
Yoshio Katsuzaki, Chita, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 11, 1981, Ser. No. 242,573
Claims priority, application Japan, Nov. 19, 1980, 55-48418
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70



270,536
PICTURE IMAGE MEMORY-SEARCH APPARATUS WITH COPYING FUNCTION
Kunio Hara, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Mar. 13, 1981, Ser. No. 243,606
Claims priority, application Japan, Sep. 17, 1980, 55-38065
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—28

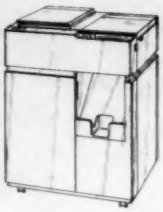


270,537
COMBINED ELECTRONIC COPYING MACHINE AND SORTER
Kunio Hara, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jun. 11, 1981, Ser. No. 272,646
Claims priority, application Japan, Dec. 16, 1980, 55-52233
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

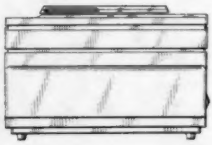


270,538
ELECTRONIC COPYING MACHINE OR THE LIKE
Shigeki Yasutani, Kashiwa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jun. 16, 1981, Ser. No. 274,077
Claims priority, application Japan, Dec. 25, 1980, 55-53894
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30

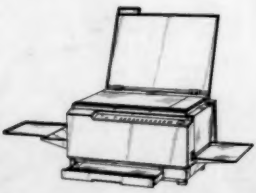
270,539
ELECTRONIC COPYING MACHINE OR THE LIKE
Hideyuki Horie, Kamagaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jun. 16, 1981, Ser. No. 274,163
Claims priority, application Japan, Dec. 25, 1980, 55-53895
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



270,540
ELECTROPHOTOGRAPHIC COPYING MACHINE
Mitsuru Sakurai, Musashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 6, 1981, Ser. No. 251,091
Claims priority, application Japan, Oct. 9, 1980, 55-42195
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



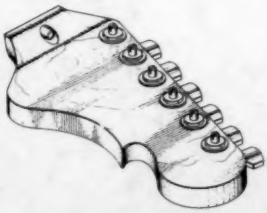
270,541
ELECTRONIC COPYING MACHINE OR THE LIKE
Yozo Matsuzaka, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jun. 16, 1981, Ser. No. 274,078
Claims priority, application Japan, Dec. 16, 1980, 55-52234
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



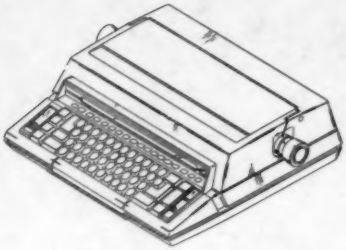
270,542
LENS MASK
Alphonse P. Cinque, 65 Earle Ave., Lynbrook, N.Y. 11563
Filed Jun. 13, 1980, Ser. No. 159,437
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38

270,543
GUITAR
Robert F. McNally, 11 Longview Rd., Rockaway, N.J. 07866
Filed Jun. 2, 1981, Ser. No. 269,470
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—19

270,544
GUITAR HEAD
C. Leo Fender, 1510 Dana Pl., Fullerton, Calif. 92635
Filed Jun. 5, 1981, Ser. No. 270,908
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



270,545
TYPEWRITER
Robert S. Metzner, Syracuse, N.Y., assignor to SCM Corporation, New York, N.Y.
Filed Mar. 23, 1981, Ser. No. 246,822
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1

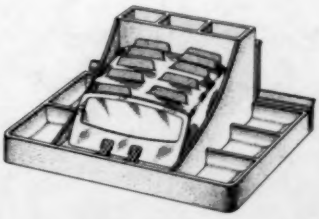


270,546
TRANSACTION IDENTIFICATION CARD
Thor A. H. Malmberg, Stockholm, Sweden, assignor to AB ID-Kort, Solna, Sweden
Filed Mar. 10, 1981, Ser. No. 242,235
Term of patent 14 years
Int. Cl. D19—*05*
U.S. Cl. D19—10

270,547
PEN
Harold F. Bajusz, Butler, N.J., assignor to Accutec, Inc., Wallington, N.J.
Filed Dec. 12, 1980, Ser. No. 215,865
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

270,548
SUPPORT STAND FOR A GLOBE
Alf Rimer, Herlev, Denmark, assignor to Scan-Globe A/S, Havdrup, Denmark
Filed Mar. 31, 1981, Ser. No. 249,591
Claims priority, application Denmark, Oct. 17, 1980, 860/80
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—61

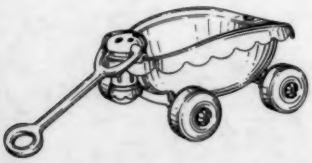
270,549
COMBINED TELEPHONE LIST FINDER AND DESK TRAY
Robert W. Burton, Franklin Lakes; Joseph C. Crowley, Jr., Summit; Richard A. Davi, Glenwood, all of N.J., and Albrecht Goertz, New York, N.Y., assignors to Rolodex Corporation, Secaucus, N.J.
Filed Oct. 5, 1981, Ser. No. 308,481
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76



270,550
VEHICLE TOP SUPPORT FOR THREE-WAY SIGN DISPLAY
Charles S. Sax, 4061 SW. Flower, Portland, Oreg. 97221
Filed Mar. 16, 1981, Ser. No. 243,880
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—43

270,551
GAME CARD HOLDER
Lyman Thayer, Greenwood, S.C., assignor to Phil Kemp, Greenwood, S.C., a part interest
Filed May 22, 1981, Ser. No. 266,160
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—54

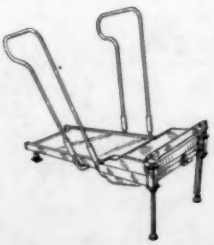
270,552
TOY WAGON
Eugene J. Echterling, 22740 Macfarlane Dr., Woodland Hills, Calif. 91364
Filed May 26, 1981, Ser. No. 267,266
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76



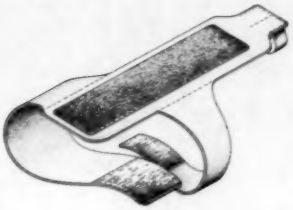
270,553
TOY STROLLER
Eugene J. Echterling, 22740 Macfarlane Dr., Woodland Hills, Calif. 91364
Filed May 26, 1981, Ser. No. 267,262
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

270,554
ACTION TOY NOSE
Glenn Messina, 19 Sylvia La., Plainview, N.Y. 11803
Filed Apr. 27, 1981, Ser. No. 257,766
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—190

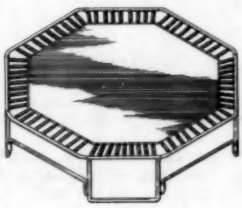
270,555
EXERCISE TREADMILL
Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321
Filed Nov. 16, 1981, Ser. No. 321,466
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—192



270,556
SPORTS WRIST BRACE
Rick A. Kneisley, 1310 Chestnut Ridge, Humble, Tex. 77339
Filed May 18, 1981, Ser. No. 265,028
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—233



270,557
TRAMPOLINE
Johnie E. Williams, P.O. Box 788, Fayetteville, Ga. 30214
Filed May 5, 1981, Ser. No. 260,799
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—235

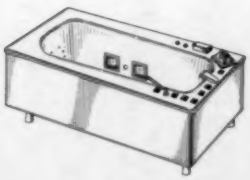


270,558
TEETER-TOTTER
Stanley D. Fuller, P.O. Box 71, Shiocton, Wis. 54170
Filed Oct. 5, 1981, Ser. No. 305,021
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—251

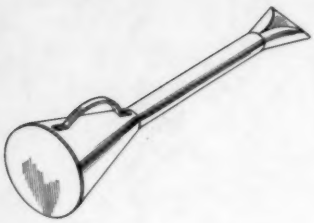
270,559
SPRAY HEAD
Franco Clivio, and Dieter Raffler, both of Ulm, Fed. Rep. of Germany, assignors to GARDENA Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Jan. 30, 1981, Ser. No. 230,147
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, GRAIII1244/80
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

270,560
SPRAYER
Franco Clivio, and Dieter Raffler, both of Ulm, Fed. Rep. of Germany, assignors to GARDENA Kress + Kastner GmbH, Fed. Rep. of Germany
Filed Jan. 30, 1981, Ser. No. 230,149
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1980, 1244/80
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

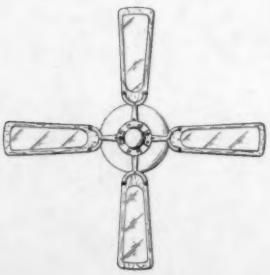
270,561
BATH TUB
Jean-Michel Brossier, 3081 Motor Ave., Los Angeles, Calif. 90064
Filed Sep. 29, 1980, Ser. No. 192,092
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



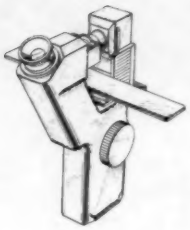
270,562
SHOVEL
Boyd D. Skeen, Rte. 5, Box 112, Asheboro, N.C. 27203
Filed Jan. 8, 1981, Ser. No. 223,278
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D23—138.2



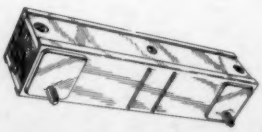
270,563
COMBINED CEILING FAN AND LIGHT
Todd L. Phillips, Huntington Station, N.Y., assignor to Quoizel, Inc., Hauppauge, N.Y.
Filed Apr. 27, 1980, Ser. No. 257,957
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—158



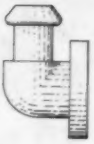
270,564
LENS METER
Takeshi Machida, Sakado, and Hiroshi Koyama, Otone, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 16, 1980, Ser. No. 169,247
Claims priority, application Japan, Apr. 30, 1980, 55-17214
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



270,565
HAEMODIALYZER OR THE LIKE
Robert Benattar, Lyons, and Michel Cronenberger, Chassagny, both of France, assignors to Hospal-Sodip SA, Meyzieu, France
Filed Jan. 16, 1981, Ser. No. 225,859
Claims priority, application Benelux, Jul. 21, 1980, 70.521
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21

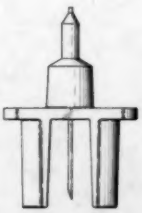


270,566
TUBE COUPLER FOR A HEARING AID EAR MOLD
Harry Bennett, 3544 N. Mariposa, Fresno, Calif. 93726
Filed Oct. 21, 1980, Ser. No. 199,318
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—35



270,567
DECK SKIRTING FOR PORTABLE SPA
Michael L. Conlin, Merced, Calif., assignor to Conlin Hot Tubs/Spas, Crockett, Calif.
Filed May 22, 1981, Ser. No. 266,026
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—38

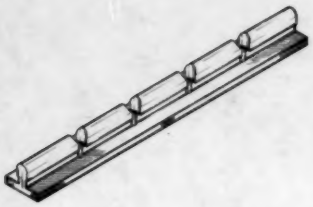
270,568
ADAPTER FOR MAKING CONNECTION INTO A CONTAINER THROUGH A PIERCEABLE TOP
Lee C. Armstrong, 2486 Baxter Rd. S.W., Atlanta, Ga.
Filed Jul. 1, 1980, Ser. No. 164,927
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—52



270,569
DOOR STRUCTURE
Ernesto Cascone, 279 Cocksfield Ave., Downsview, Ontario, Canada (M3H 3T8), and Vincent Cascone, 36 Mayvern Crescent, Richmond Hill, Ontario, Canada (L4C 5J4)
Filed Apr. 7, 1981, Ser. No. 251,991
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

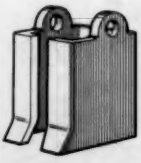
270,570
DUAL UNIT CABLE STAY BUILDING
Adam T. Schildge, Jr., 899 Green St., San Francisco, Calif. 94133
Filed Jun. 15, 1981, Ser. No. 272,672
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56

270,571
SPLICE ELEMENT FOR A LADDER SAFETY RAIL
Gary W. Havener, Mineral Wells, Tex., assignor to DHV, Inc., Mineral Wells, Tex.
Filed Jun. 8, 1981, Ser. No. 271,517
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—68



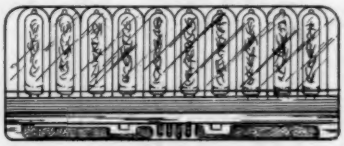
270,572
SCAFFOLD ANCHORAGE LUG
Allan N. Black, Cronulla, Australia, assignor to Guest Keen & Nettlefolds (Aust) Limited, Melbourne, Australia
Filed Aug. 20, 1981, Ser. No. 294,455
Claims priority, application United Kingdom, Mar. 7, 1981, 999279
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—68

270,573
SCAFFOLD BRACE ANCHORAGE SOCKET
Allan N. Black, Cronulla, Australia, assignor to Guest Keen & Nettlefolds (Aust) Limited, Melbourne, Australia
Filed Aug. 20, 1981, Ser. No. 294,456
Claims priority, application United Kingdom, Mar. 7, 1981, 999278
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—68

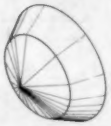


270,574
SCAFFOLD SPRING WEDGE
Allan N. Black, Cronulla, Australia, assignor to Guest Keen & Nettlefolds (Aust) Limited, Melbourne, Australia
Filed Aug. 20, 1981, Ser. No. 294,457
Claims priority, application United Kingdom, Mar. 7, 1981, 999277
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—68

270,575
MULTILAMP PHOTOFLASH UNIT
David R. Broadt, Lewisburg, Pa., and Emery G. Audesse, Beverly, Mass., assignors to GTE Products Corporation, Stamford, Conn.
Filed Aug. 27, 1980, Ser. No. 181,939
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—2



270,576
ELECTRONIC FLASHING PASTIE
Larry E. Thompson, 3505 Rochelle Rd., Irving, Tex. 75062
Filed Mar. 4, 1981, Ser. No. 240,589
Term of patent 14 years
Int. Cl. D10—*06*; D26—*02*
U.S. Cl. D26—39



270,577

LUMINAIRE REFLECTOR

Hendrik A. J. DeVos, Swansea, Mass., and Ronald L. Sitzema, Jr., Ellsworth, Mich., assignors to GTE Products Corporation, Stamford, Conn.

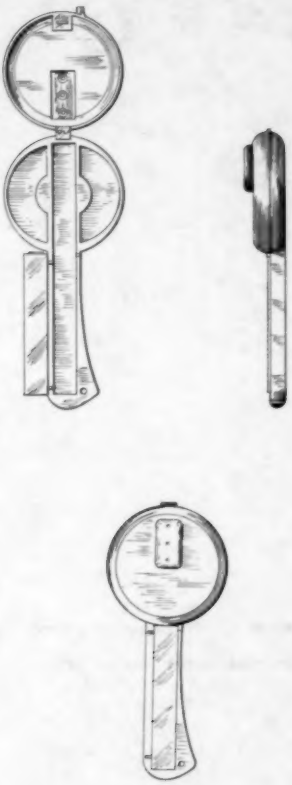
Filed Mar. 4, 1981, Ser. No. 240,344
Term of patent 14 years
Int. Cl. D26—*65*
U.S. Cl. D26—118

270,578

COMPACT

Leroy Washington, Jr., 1793 Regency Dr., Sierra Vista, Ariz. 85635

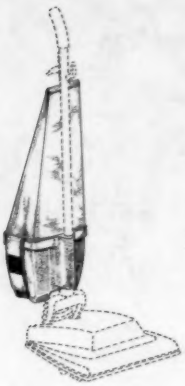
Filed Jul. 13, 1981, Ser. No. 283,076
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—78



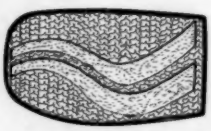
270,579
MAKEUP COMPACT
Jody L. Numbers, Scottsdale, Ariz., and Eva K. Hain, Los Angeles, Calif., assignors to RFA Corp., Beverly Hills, Calif.
Filed Jan. 28, 1982, Ser. No. 343,517
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—78

270,580
COMPACT
Leroy Washington, Jr., 1793 Regency Dr., Sierra Vista, Ariz. 85635
Filed Jul. 13, 1981, Ser. No. 283,074
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—82

270,581
DIRT CUP UNIT FOR A VACUUM CLEANER OR THE LIKE
Richard A. Wareham, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Oct. 8, 1980, Ser. No. 195,231
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—31



270,582
CARPET CLEANING MIT
Joseph A. Pietrocola, 777 Cherry St., New Milford, N.J. 07646
Filed Aug. 6, 1981, Ser. No. 290,777
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—40



270,583
KIOSK FOR AUTOMATIC BANKING OR THE LIKE
Randall L. Elliott, and James A. Pickel, both of Oklahoma City, Okla., assignors to Liberty National Bank & Trust Co., Oklahoma City, Okla.
Filed Aug. 28, 1981, Ser. No. 297,145
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—28

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF SEPTEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See*—
Tokar, Thomas, 4,403,661, Cl. 169-38.000.

AB Volvo Penta: *See*—
Pichl, Heinz, 4,403,969, Cl. 440-56.000.

Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A. Flexible pipe. 4,403,631, Cl. 138-130.000.

Abe, Hideki; Yamaguchi, Kiyomi; and Asano, Yuzo, to Dowa Mining Co., Ltd. Method of treating electrolytic solution of copper for purification and reuse thereof. 4,404,071, Cl. 204-108.000.

Abe, Hisao: *See*—
Iwaya, Shoichi; Masumura, Hitoshi; Midori, Yoshifumi; Oikawa, Yasunobu; and Abe, Hisao, 4,404,029, Cl. 501-139.000.

Abolins, Visvaldis; Bopp, Richard C.; Caraher, Joel M.; and Lovgren, Eric M., to General Electric Company. Polyphenylene ether resin compositions for EMI electromagnetic interference shielding. 4,404,125, Cl. 252-511.000.

Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., to General Electric Company. Compositions comprising copolymers of a vinyl aromatic compound and an unsaturated cyclic anhydride and impact improvers. 4,404,321, Cl. 525-68.000.

Acoustiquide Corporation: *See*—
Demenus, Richard, 4,404,611, Cl. 360-137.000.

Adachi, Shoichi, to N.C.A. Co., Ltd. Cloth-cutting machine. 4,403,416, Cl. 30-273.000.

Adam, Fedor Y.: *See*—
Nudelman, Boris I.; Cheipkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Adams, James B., Jr., to Otis Engineering Corporation. Locking mandrel having dogs for latching to a landing nipple and lugs for latching to an operator reciprocal in the landing nipple. 4,403,657, Cl. 166-322.000.

Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., to Polysar International S.A. Isomerization. 4,404,416, Cl. 585-671.000.

Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., to Polysar International S.A. Isomerization. 4,404,417, Cl. 585-671.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,404,301, Cl. 524-99.000.

Advanced Mechanical Technology, Inc.: *See*—
Gerstmann, Joseph; and Vasilakis, Andrew D., 4,403,572, Cl. 122-20.00B.

Agency of Industrial Science and Technology: *See*—
Okuo, Takayasu; and Takano, Kiyonami, 4,404,482, Cl. 310-11.000.

Agfa-Gevaert AG: *See*—
Burger, Erich; Bickl, Horst; and Huber, Hans-Peter, 4,403,849, Cl. 355-8.000.
Osegowitsch, Viktor; Sperber, Werner; and Viehrig, Wolfgang, 4,403,846, Cl. 354-310.000.
Rapp, Heinz, 4,403,370, Cl. 15-308.000.
von Stein, Werner; and Fergg, Berthold, 4,403,854, Cl. 355-41.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Kohler, Robert; Schiffarth, Karlchristian; Kober, Heinrich; and Nippe, Burkhard, 4,404,253, Cl. 428-327.000.

Agfa-Gevaert N.V.: *See*—
Buelens, Edward; and Goossens, Carolus C., 4,403,845, Cl. 354-275.000.

Aidar, Fernando H., to Eucatex S.A. Industria e Comercio. Drawer for furniture. 4,403,817, Cl. 312-330.00R.

Aiki, Kunio; Nakamura, Michiharu; and Umeda, Jun-ichi, to Hitachi, Ltd. Semiconductor laser device. 4,404,678, Cl. 372-45.000.

Air Products and Chemicals, Inc.: *See*—
Daniel, Chelliah, 4,404,397, Cl. 562-546.000.
Rentler, Robert J.; and Sproul, David D., 4,404,008, Cl. 62-11.000.

Aisin Seiki Company, Limited: *See*—
Iwasaki, Shinichiro, 4,403,515, Cl. 73-862.380.
Mori, Kojiro, 4,404,538, Cl. 337-336.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Harada, Kuniyoshi; and Fujie, Naofumi, 4,404,632, Cl. 364-425.000.
Nishida, Koji; and Kawai, Taneichi, 4,404,508, Cl. 318-611.000.

Akahori, Kimihiko; Maeno, Shigeo; Kodama, Hideyo; and Morisada, Norio, to Hitachi, Ltd. Method of producing elongated large-size forged article. 4,404,041, Cl. 148-2.000.

Akeson, Wayne H.: *See*—
Woo, Savio L-Y.; and Akeson, Wayne H., 4,403,606, Cl. 128-92.00D.
Woo, Savio L-Y.; Akeson, Wayne H.; and Page, Dan L., 4,403,607, Cl. 128-92.00D.

Akita, Sigeyuki: *See*—
Kodera, Masao; Akita, Sigeyuki; and Yoshino, Yasuhisa, 4,404,541, Cl. 340-32.000.

Akiyama, Iwao: *See*—
Okiura, Kunio; Akiyama, Iwao; Terada, Hiroshi; Arikawa, Yoshijiro; Baba, Akira; and Morita, Shigeki, 4,403,941, Cl. 431-10.000.

Aktiebolaget Draco: *See*—
Thalen, Bror A.; and Brattsand, Ralph L., 4,404,200, Cl. 424-241.000.

Aktiebolaget IRO: *See*—
Tholander, Lars H. G., 4,403,745, Cl. 242-47.010.

Aktiengesellschaft Adolf Saurer: *See*—
Stacher, Miguel A., 4,403,630, Cl. 139-102.000.

Akzona Incorporated: *See*—
Patton, George A., 4,403,411, Cl. 29-879.000.
Zengel, Hans G.; and Bergfeld, Manfred, 4,404,401, Cl. 564-416.000.

Alabaster, Ramon J.; and Wright, Stanley H. B., to Merck & Co., Inc. Resolution of α-pivaloyloxyethyl-(S)-3-(3,4-dihydroxyphenyl)-2-methylalantinate into its α and β isomers. 4,404,392, Cl. 560-40.000.

Albany International Corp.: *See*—
Romanski, Eric R.; and Josef, Michael J., 4,403,632, Cl. 139-383.00A.

Albaugh, Michael E., to Atari, Inc. Data processing system with latch for sharing instruction fields. 4,404,629, Cl. 364-200.000.

Alcala Perales, Maria T.: *See*—
Rivelles Sabater, Maria D.; Alcala Perales, Maria T.; Manes Uso, Carmen; and Calabuig Sanchis, Maria A., 4,403,637, Cl. 150-12.000.

Alco Standard Corporation: *See*—
Lesher, M. Kenneth, 4,403,448, Cl. 49-225.000.

Aliev, Gabil G.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,403,631, Cl. 138-130.000.

Allard, Jules N.: *See*—
Bower, Raymond M.; and Allard, Jules N., 4,403,361, Cl. 12-142.00R.

Allen-Bradley Company: *See*—
Baran, Michael S.; Felber, Arthur J.; and Fillus, Gary C., 4,404,445, Cl. 200-314.000.
Grudowski, Raymond A., 4,404,651, Cl. 364-900.000.

Allied Corporation: *See*—
Mason, Charles D.; and Tuller, Harold W., 4,404,325, Cl. 525-179.000.

Allis-Chalmers Corporation: *See*—
Baugh, Robert T., 4,403,467, Cl. 56-119.000.

Allison, Clifford, Jr.: *See*—
Gurney, John W.; Guerci, James N.; and Allison, Clifford, Jr., 4,404,565, Cl. 343-881.000.

Almahmoud, Saad; Kraus, Hubert; and Riepl, Martin, to Siemens Aktiengesellschaft. Method for the manufacture of layer capacitors. 4,403,381, Cl. 29-25.420.

Alps Electric Co., Ltd.: *See*—
Ohba, Hiroki, 4,404,436, Cl. 200-153.00J.
Okuya, Tsutae; and Anzai, Nobuaki, 4,404,540, Cl. 338-161.000.

Altendorf, Kurt; and Thiele, Siegfried, to Wilhelm Altendorf GmbH & Co. KG. Movable protective hood for power tool of a work tool machine. 4,403,534, Cl. 83-100.000.

Altland, Henry W.; and Shiao, Daniel D., to Eastman Kodak Company. Mesoionic 1,2,4-triazolium silver halide stabilizer precursors. 4,404,390, Cl. 548-263.000.

Altshuler, Boris N.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.

Alvarado-Urbina, Gabriel G.; and Ogilvie, Kelvin K. Lyophilized phosphorylated nucleosides. 4,404,368, Cl. 536-27.000.

Alvarez, Jose A. A.; and Thompson, Ralph B., to T & R Chemicals, Inc. Antihypertension treatment and composition therefor. 4,404,202, Cl. 424-248.500.

Alvermann, Palmer C. Apparatus for raising and lowering an object. 4,403,760, Cl. 248-284.000.

Amano, Yoshifumi, to Sony Corporation. Display apparatus. 4,403,831, Cl. 350-334.000.

American Cyanamid Company: *See*—
Asato, Goro, 4,404,224, Cl. 424-321.000.
Baker, Pamela K.; and Kiernan, Jane A., 4,404,222, Cl. 424-304.000.
Boothe, James H.; and Ross, Adma S., 4,404,374, Cl. 544-26.000.
Boothe, James H.; and Ross, Adma S., 4,404,375, Cl. 544-27.000.
Boothe, James H.; and Ross, Adma S., 4,404,376, Cl. 544-27.000.
Cesark, Frank F.; Manfre, Robert J.; and Thomas, Daniel W., 4,403,792, Cl. 282-27.500.
Floyd, Middleton B., Jr., 4,404,393, Cl. 560-121.000.
Ladner, David W.; and Cross, Barrington, 4,404,402, Cl. 564-442.000.
Miner, Thomas G.; and Bernstein, Seymour, 4,404,365, Cl. 536-4.100.
Orwick, Philip L.; and Templeton, Andrew R., 4,404,012, Cl. 71-92.000.
Parekh, Girish G.; Blank, Werner J.; and Schirmann, Peter J., 4,404,332, Cl. 525-428.000.
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,404,195, Cl. 424-180.000.
Siddens, Jack K., 4,404,148, Cl. 260-465.00F.

American Hoechst Corporation: *See*—
Neumann, Don B.; Norton, Lyle K.; and Olson, Eric V., 4,404,569, Cl. 346-108.000.

American Microsystems, Inc.: *See*—
Amir, Gideon; Haque, Yusuf; and Gregorian, Roubik, 4,404,525, Cl. 330-9.000.

American Standard Inc.: *See*—
Safford, Laurance F., 4,404,426, Cl. 178-22.030.

AMF Incorporated: *See*—
Hou, Kenneth C., 4,404,285, Cl. 436-16.000.

Amir, Gideon; Haque, Yusuf; and Gregorian, Roubik, to American Microsystems, Inc. Switched capacitor gain stage with offset and switch feedthrough cancellation scheme. 4,404,525, Cl. 330-9.000.

AMP Incorporated: *See*—
Weber, Robert N., 4,403,819, Cl. 339-75.0MP.
Zimmerman, John A., Jr.; and Long, William B., 4,403,821, Cl. 339-97.00P.

Ampex Corporation: *See*—
Ryan, John O., 4,404,499, Cl. 315-371.000.

Amtrol Inc.: *See*—
Kirk, Kenneth L., 4,403,385, Cl. 29-157.3AH.

Anand, Madhu; Baddour, Raymond F.; and Cohen, Robert E., to Massachusetts Institute of Technology. Surface fluorinated polymers. 4,404,256, Cl. 428-409.000.

Andersen, Thomas S.: *See*—
Grieve, Harold R.; and Andersen, Thomas S., 4,403,727, Cl. 229-27.000.

Anderson, Barry J., to Procter & Gamble Company, The. Enzyme detergent composition. 4,404,128, Cl. 252-546.000.

Anderson, Richard D., to Pako Corporation. Disc film frame position indicator. 4,403,855, Cl. 355-64.000.

Anderson, Robert A.: *See*—
Curran, Donald G.; and Anderson, Robert A., 4,403,794, Cl. 285-45.000.

Andrews, Christopher M., to Ciba-Geigy Corporation. Heat-curable epoxide resin compositions. 4,404,356, Cl. 528-99.000.

Anfossi, Nicola: *See*—
De Toffol, Andrea; Anfossi, Nicola; and Veroli, Gianfranco, 4,404,338, Cl. 526-86.000.

Angelini, Gianfranco; Leoncini, Novello; Pallesi, Bice; and Paoletti, Ugo, to SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the continuous production of viscose rayon yarns having high degree of whiteness. 4,404,157, Cl. 264-195.000.

Angelo, Bardotti, to Honeywell Information Systems Inc. Multiprocessor system. 4,404,628, Cl. 364-200.000.

Angevine, Philip J.; and Oleck, Stephen M., to Mobil Oil Corporation. Residua demetalation/desulfurization catalyst and methods for its use. 4,404,097, Cl. 208-210.000.

Anglada, Leonard R.: *See*—
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,403,988, Cl. 604-118.000.

Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, to Schering Aktiengesellschaft. $\Delta^{9(11)}$- And Δ^{16}-21-chloro-20-keto steroids of the pregnane and D-homopregnane series, their preparation and use as intermediates for the synthesis of highly effective corticoids. 4,404,141, Cl. 260-397.300.

Anzai, Nobuaki: *See*—
Okuya, Tsutae; and Anzai, Nobuaki, 4,404,540, Cl. 338-161.000.

Aoyama, Masaharu: *See*—
Oshima, Jiro; Aoyama, Masaharu; Yasuda, Seiji; and Yonezawa, Toshio, 4,403,392, Cl. 29-569.00R.

Aoyama, Tadamasa, to Kabushiki Kaisha Sanesu Shoko. Positioning controlling method. 4,404,626, Cl. 364-174.000.

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van der Weerdt, Antonius J. A.; Plomp, Roeland; and Apeldoorn, Willem, 4,404,127, Cl. 252-522.00R.

Appleton Papers Inc.: *See*—
Kerr, John F., 4,404,460, Cl. 219-211.000.

Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; and Nakazyo, Kiyoshi, to Fuji Photo Film Co., Ltd. Photographic light sensitive element containing yellow color coupler and method for forming yellow photographic images. 4,404,274, Cl. 430-389.000.

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Numazawa, Akio; and Arai, Hajime, 4,403,526, Cl. 74-740.000.

Arai, Yasuyuki: *See*—
Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozeki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.

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Kawatani, Kimio; and Kaji, Ryoji, 4,404,034, Cl. 106-238.000.

Arala-Chaves, Mario, to Berri-Balzac. Immuno-suppressive substance, its isolation process, and its therapeutic use. 4,404,194, Cl. 424-177.000.

Arata, Ryozo: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,404,301, Cl. 524-99.000.

Arends, Berend J.: *See*—
den Hollander, Cornelis; and Arends, Berend J., 4,404,231, Cl. 426-602.000.

Arikawa, Hiroo, to San-O-Industrial Corp. Quick-acting fuse. 4,404,537, Cl. 337-232.000.

Arikawa, Yoshijiro: *See*—
Okiura, Kunio; Akiyama, Iwao; Terada, Hiroshi; Arikawa, Yoshijiro; Baba, Akira; and Morita, Shigeki, 4,403,941, Cl. 431-10.000.

Ark-les Corporation: *See*—
Mazzola, Ralph, 4,403,407, Cl. 29-749.000.

Arnoldi, Douglas R.: *See*—
Kocot, Ray H.; Rudd, Robert E., III; and Arnoldi, Douglas R., 4,404,573, Cl. 346-140.00R.

Arons, Richard M.; and Dusek, Joseph T. Method for preparing corrosion-resistant ceramic shapes. 4,404,154, Cl. 264-62.000.

Arthur D. Little, Inc.: *See*—
McCullough, John E., 4,403,494, Cl. 72-360.000.

Aruga, Masayoshi: *See*—
Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, 4,404,183, Cl. 424-19.000.

Asano, Kiyomitsu; Kondo, Toshikatsu; Jozuka, Masao; and Sakaida, Atsuo, to Brother Kogyo Kabushiki Kaisha; and Nippon Telecommunication Engineering Company. Armature support device of a print head. 4,403,875, Cl. 400-124.000.

Asano, Shuichi, to Nippon Seiko Kabushiki Kaisha. Device for locking webbing for the seat belt of an automotive vehicle. 4,403,751, Cl. 242-107.200.

Asano, Yuzo: *See*—
Abe, Hideki; Yamaguchi, Kiyomi; and Asano, Yuzo, 4,404,071, Cl. 204-108.000.

ASARCO Incorporated: *See*—
Di Martini, Carl R.; and Casteras, John E., 4,404,026, Cl. 75-63.000.

Asato, Goro, to American Cyanamid Company. Alkanesulfonanilide derivatives and pharmaceutically acceptable acid addition salts thereof for increasing the growth rate and/or improving the lean meat to fat ratio of warm blooded animals. 4,404,224, Cl. 424-321.000.

Asdigian, George, to UOP Inc. Mercaptan extraction process with recycled alkaline solution. 4,404,098, Cl. 208-235.000.

Asea Aktiebolag: *See*—
Lofgren, Folke; and Soderstrom, Sven-Erik, 4,403,862, Cl. 356-437.000.

Ash, Stephen R.; and Loeb, Marvin P., to Biotek, Inc. System for demand-based adminstration of insulin. 4,403,984, Cl. 604-50.000.

Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines): *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,404,045, Cl. 148-31.500.

Asta, Ltd.: *See*—
Gotman, Alexander, 4,404,453, Cl. 219-121.0LD.

Astier, Jean-Francois; and Bessaguet, Louis, to Legrand. Transmission device and machine tool comprising same. 4,404,449, Cl. 219-69.00V.

Astral Industries, Inc.: *See*—
Hazelett, David A.; Shaw, Charles B.; and McCombs, Paul W., 4,403,380, Cl. 27-12.000.

Atari, Inc.: *See*—
Albaugh, Michael E., 4,404,629, Cl. 364-200.000.

Ateliers de la Motobecane S.A.: *See*—
Jaulmes, Christian, 4,403,672, Cl. 180-205.000.

Ateliers des Charmilles S.A.: *See*—
Bommeli, M. Bernard, 4,404,448, Cl. 219-69.00G.

Atkinson, Michael L., to Ball Corporation. Method for necking thin wall metallic containers. 4,403,493, Cl. 72-356.000.

Atlantic Richfield Company: *See*—
Bi, Le-Khac; Dillon, Mary E.; and Sharik, Clyde, 4,404,111, Cl. 252-8.55D.
Huribut, Roy B., 4,403,459, Cl. 52-103.000.

Audeh, Costandi A.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Delayed coking process. 4,404,092, Cl. 208-131.000.

Aulhorn, Elfriede; Kocher, Jakob; and Reiner, Josef, to Oculus Optikgeraete GmbH. Apparatus for testing twilight vision and blinding sensitivity. 4,403,842, Cl. 351-237.000.

Austin, Eric P., to Simon-Hartley Limited. Sludge thickening. 4,404,099, Cl. 210-205.000.

Autoflug GmbH: *See*—
Palloks, Armin, 4,403,376, Cl. 24-205.170.

Automatisme et Technique: *See*—
Goutard, Rene-Michel; and Piry, Pierre, 4,403,461, Cl. 53-282.000.

Automotive Products Limited: *See*—
Norris, Peter J.; Parker, Frederick J.; and Windsor, Harry M., 4,403,682, Cl. 192-0.033.

Avco Corporation: *See—*
Pekari, Frederick J.; and Johnson, Robert E., 4,403,912, Cl. 415-150.000.

Ayers, Scott D.: *See—*
Clark, Frederic L.; and Ayers, Scott D., 4,404,566, Cl. 346-1.100.

B. F. Goodrich Company, The: *See—*
Bush, Charles N.; and Doyle, Thomas J., 4,404,339, Cl. 526-88.000.
Chang, Daniel M., 4,404,326, Cl. 525-223.000.
Masler, William F., III, 4,404,309, Cl. 524-379.000.

Baba, Akira: *See—*
Okiura, Kunio; Akiyama, Iwao; Terada, Hiroshi; Arikawa, Yoshijiro; Baba, Akira; and Morita, Shigeki, 4,403,941, Cl. 431-10.000.

Babb, Larry F., to Emerson Electric Co. Cable connector. 4,403,885, Cl. 403-317.000.

Babbitt, Gerald J.; and Kasap, Ahmet. Sinus evacuator apparatus. 4,403,611, Cl. 604-73.000.

Babcock-Hitachi, Ltd.: *See—*
Okiura, Kunio; Akiyama, Iwao; Terada, Hiroshi; Arikawa, Yoshijiro; Baba, Akira; and Morita, Shigeki, 4,403,941, Cl. 431-10.000.

Babler, Fridolin, to Ciba-Geigy Corporation. Novel modification of perylenetetracarboxylic acid-bis-(3,5-dimethylphenyl)imide. 4,404,385, Cl. 546-37.000.

Babler, Fridolin, to Ciba-Geigy Corporation. Process for the preparation of opaque perylenetetracarboxylic acid bis-(3,5-dimethylphenyl)imide). 4,404,386, Cl. 546-37.000.

Bach, Erik; and Ryaa, Jan, to Interlego A.G. Track assembly for toy trains. 4,403,733, Cl. 238-10.00E.

Bachner, George L., to Nimco Corporation. Method and device for closing and sealing gable shaped folding cartons. 4,403,465, Cl. 53-477.000.

Bachschmid, Fritz: *See—*
Gebauer, Gerhard; and Bachschmid, Fritz, 4,403,924, Cl. 417-388.000.

Bachtel, Robert W.; and Cash, Dennis R., to Chevron Research Company. Three-stage hydrocracking process. 4,404,088, Cl. 208-59.000.

Baddour, Raymond F.: *See—*
Anand, Madhu; Baddour, Raymond F.; and Cohen, Robert E., 4,404,256, Cl. 428-409.000.

Bader, Hans. Shut-down apparatus for diesel engines. 4,403,580, Cl. 123-198.0DB.

Bailey, Ben J.: *See—*
Bailey, Roy E.; and Bailey, Ben J., 4,403,531, Cl. 81-483.000.

Bailey, Ernst C.; Vickers, William E.; and Stain, Donald B., to UNC Recovery Corporation. Apparatus for contacting substantially immiscible liquids. 4,404,173, Cl. 422-257.000.

Bailey, Roy E.; and Bailey, Ben J. Preset torque wrench. 4,403,531, Cl. 81-483.000.

Baird, William C., Jr.: *See—*
Eberly, Paul E., Jr.; and Baird, William C., Jr., 4,404,094, Cl. 208-139.000.

Baker, Alan C.; Shiovitz, Nathan N.; and Whiting, George E., to Brunswick Corporation. Release and alignment mechanism for jet-propelled projectiles. 4,403,435, Cl. 42-1.00F.

Baker International Corporation: *See—*
Haynes, Andrew, 4,403,654, Cl. 166-73.000.

Baker, Pamela K.; and Kiernan, Jane A., to American Cyanamid Company. Phenylethanolamine derivatives and acid addition salts thereof for enhancing the growth rate of meat-producing animals and improving the efficiency of feed utilization thereby. 4,404,222, Cl. 424-304.000.

Baldwin, Chandler M., to Memorex Corporation. Precipitated alumina for use in magnetic recording disc media. 4,404,238, Cl. 427-128.000.

Ball Corporation: *See—*
Atkinson, Michael L., 4,403,493, Cl. 72-356.000.

Ball, Douglas. Powered vehicle. 4,403,673, Cl. 180-214.000.

Ballert, Bruce Q., to General Electric Company. Resole compositions and laminates made therefrom. 4,404,358, Cl. 528-158.500.

Balthazor, Terry M.: *See—*
Goodin, Richard D.; Chupp, John P.; Balthazor, Terry M.; and Coleman, James P., 4,404,069, Cl. 204-59.00R.

Bamber, George E.: *See—*
Valentine, Clark; and Bamber, George E., 4,403,554, Cl. 108-23.000.

Bampfield, Howard A.: *See—*
Yorke, William J.; Binet, Rejean; Lee, Ming C.; and Bampfield, Howard A., 4,404,050, Cl. 149-2.000.

Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito. Direct current motor. 4,404,485, Cl. 310-198.000.

Banerjee, Sujit; and Pack, Edward J., Jr. Apparatus and method for the reduction of interferences in chromatography. 4,403,503, Cl. 73-61.10C.

Banyu Pharmaceutical Co., Ltd.: *See—*
Miyano, Tetsuji; Suzuki, Kunio; and Harada, Nobuo, 4,404,378, Cl. 544-131.000.

Baraff, David R.: *See—*
Long, John R.; Miner, Carla J.; Streater, Richard W.; and Baraff, David R., 4,404,555, Cl. 340-784.000.

Baran, Michael S.; Felber, Arthur J.; and Fillus, Gary C., to Allen-Bradley Company. Pushbutton switch operator assembly. 4,404,445, Cl. 200-314.000.

Baranowski, Michael: *See—*
Edelman, William; and Baranowski, Michael, 4,403,983, Cl. 604-43.000.

Barber, Richard B.: *See—*
Taylor, George W. B.; and Barber, Richard B., 4,404,454, Cl. 219-121.0LK.

Bard, William B.: *See—*
Walters, John O.; and Bard, William B., 4,404,637, Cl. 364-494.000.

Barda, Henry J., to Saytech, Inc. Flame retardant for polymeric compositions. 4,404,361, Cl. 528-342.000.

Bardenstein, Albert, to Berlin, Irwin J. Automated wall panel frame manufacturing apparatus. 4,403,724, Cl. 227-76.000.

Barnes, Kenneth C., to Florida Wire and Cable Company. Wire assemblies for repetitive, continuous cycle, tensile load conditions, particularly sucker rods for oil wells. 4,403,884, Cl. 403-284.000.

Barr & Stroud Limited: *See—*
Howie, Ian H., 4,404,644, Cl. 364-718.000.

Bartissol, Alain; Boutin, Jean; and Wachowski, Francois, to Rhone-Poulenc Industries. Photopolymerization of olefinically unsaturated monomers utilizing benzil dimethylacetal. 4,404,073, Cl. 204-159.230.

Base, Terence E.: *See—*
Bleiweiss, Arthur F.; and Base, Terence E., 4,403,565, Cl. 116-63.00T.

Basey, Gene. Variable rack stair rail assembly. 4,403,767, Cl. 256-66.000.

BASF Aktiengesellschaft: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased; and Thomas, Erwin, 4,404,176, Cl. 423-387.000.
Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,404,304, Cl. 524-110.000.
Lach, Dietrich; Streicher, Rolf; and Bolz, Gerhard, 4,403,993, Cl. 8-94.240.
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,404,175, Cl. 423-329.000.
Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, 4,404,126, Cl. 252-512.000.
Naarmann, Herbert; Hambrecht, Juergen; and Rieber, Norbert, 4,404,359, Cl. 528-216.000.
Sinn, Hansjorg W.; Kaminsky, Walter O.; Vollmer, Hans-Jurgen C.; and Woldt, Rudiger O. H. H., 4,404,344, Cl. 526-160.000.
Vamvakaris, Christos; Patsch, Manfred; and Mach, Wolfgang, 4,404,389, Cl. 548-201.000.

BASF Wyandotte Corporation: *See—*
Donegan, Thomas E., 4,404,036, Cl. 106-308.00M.

Bathgate, William S.: *See—*
Shevokas, Edward J.; and Bathgate, William S., 4,403,778, Cl. 277-1.000.

Batson, Bruce L. Mailbox stand. 4,403,730, Cl. 232-39.000.

Battelle Memorial Institute: *See—*
Bellmann, Gunter; Cervini, Celeste; and Sachetto, Jean-Pierre, 4,404,371, Cl. 536-98.000.
Kenan, Richard P.; and Verber, Carl M., 4,403,833, Cl. 350-356.000.
Renner, G. Frederick, 4,404,559, Cl. 340-870.280.

Bauer, Helmut; and Szasz, Tibor, to TMC Corporation. Connecting member in particular for a safety ski binding which is equipped with a ski brake. 4,403,790, Cl. 280-637.000.

Baugh, Robert T., to Allis-Chalmers Corporation. Row divider with flexible plastic sheath. 4,403,467, Cl. 56-119.000.

Baum, Frank. Combination camera bag. 4,403,638, Cl. 150-52.00J.

Baumann, James R.: *See—*
Tillotson, Henry B.; Thorud, Richard A.; and Baumann, James R., 4,403,466, Cl. 56-16.700.

Baumberger, Beat, to Mirabed AG. Apparatus for the discontinuous production of articles from foamed plastics. 4,404,168, Cl. 422-119.000.

Bautz, James E., to Kaiser Steel Corporation. Lateral weave gaging system. 4,404,634, Cl. 364-472.000.

Baxter Travenol Laboratories, Inc.: *See—*
Garver, Edward B., Sr., 4,403,990, Cl. 604-273.000.

Bayer Aktiengesellschaft: *See—*
Bier, Peter, 4,404,161, Cl. 264-328.160.
Franz, Gerhard; and Hund, Franz, 4,404,254, Cl. 428-329.000.
Freitag, Dieter; Serini, Volker; Goossens, John; Bottenbruch, Ludwig; and Hucks, Uwe, 4,404,363, Cl. 528-486.000.
Hajek, Manfred; Wagner, Kuno; Uerdingen, Walter; and Wellaer, Wolfgang, 4,404,379, Cl. 544-231.000.
Heise, Klaus-Peter; and Wedemeyer, Karlfried, 4,404,400, Cl. 564-406.000.
Jabs, Gert; Dahm, Manfred; Haus, Artur; Nehen, Ulrich; Rath, Klaus; and Weimann, Norbert, 4,404,251, Cl. 428-320.600.
Kafer, Peter; Morbitzer, Leo; Neuray, Dieter; Cohnen, Wolfgang; and Nouvertne, Werner, 4,404,351, Cl. 528-174.000.
Schapel, Dietmar, 4,404,296, Cl. 523-105.000.
Traenckner, Hans-Joachim; and Kremer, Wolfgang, 4,404,298, Cl. 524-31.000.
Wiedermann, Rolf, 4,404,294, Cl. 521-107.000.

Bazarnik, Louis M., to Dierckx Equipment Corporation. Maintenance monitor. 4,404,641, Cl. 364-569.000.

BBC Brown, Boveri & Company Limited: *See—*
Mercier, Olivier; Richter, Dag; and Schroder, Gunther, 4,404,025, Cl. 148-11.50F.
Schwarzenbach, Alfred, 4,403,477, Cl. 60-659.000.
Teufelberger, Arnulf, 4,403,915, Cl. 415-199.500.

Beard, Richard M.: *See—*
Stevens, Arthur P.; De Matteo, John; and Beard, Richard M., 4,404,666, Cl. 367-131.000.

Beatty, Raymond I.: *See—*
Wilson, Stephen K.; and Beatty, Raymond I., 4,403,417, Cl. 30-360.000.

Beazley, Phillip M.; and Dormish, Frank L., to Marathon Oil Company. Ozonation of petroleum feedstocks. 4,404,110, Cl. 252-8.55R.
Beccaris, Carlo, to Valeo Societe Anonyme. Clutch release bearing. 4,403,685, Cl. 192-98.000.
Bechtel, Richard P., Jr.: *See*—
Raymoure, Russell A.; Bechtel, Richard P., Jr.; Carson, Ray; and Don Carlos, Alva G., 4,403,695, Cl. 206-497.000.
Beckenbach, Helmuth: *See*—
Beckenbach, Ulrich; and Beckenbach, Helmuth, 4,403,951, Cl. 432-96.000.
Beckenbach, Ulrich; and Beckenbach, Helmuth. Shaft furnace for burning or firing and sintering material in lump form or pellet form and with an internal burner. 4,403,951, Cl. 432-96.000.
Becker, Udo; Braun, Konrad; and Heimburger, Norbert, to Behringwerke Aktiengesellschaft. Collagen sponge. 4,404,134, Cl. 260-112.50R.
Beecham Inc.: *See*—
Kelley, Kane L., 4,404,198, Cl. 424-235.000.
Behringwerke Aktiengesellschaft: *See*—
Becker, Udo; Braun, Konrad; and Heimburger, Norbert, 4,404,134, Cl. 260-112.50R.
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Preis, Hans M., 4,404,187, Cl. 424-101.000.
Beilock, Milton M.; and Wuerth, John M., to Rockwell International Corporation. Precision pointing and stabilization system. 4,403,838, Cl. 350-500.000.
Belcher, Roy L. Automatic pallet-making machine and method. 4,403,388, Cl. 29-429.000.
Belforte, Piero; and Bortignon, Renzo, to CSELT-Centro Studi e Laboratori Telecommunicazioni S.p.A. Data-extraction circuitry for PCM communication system. 4,404,630, Cl. 364-200.000.
Bell & Howell Company: *See*—
Grant, Frederic F., 4,403,720, Cl. 226-190.000.
Bell Telephone Laboratories, Incorporated: *See*—
Dwarakanath, Mirmira R., 4,404,544, Cl. 340-347.0AD.
Kohl, Paul A.; and Ostermayer, Frederick W., Jr., 4,404,072, Cl. 204-129.300.
Presby, Herman M., 4,403,826, Cl. 350-96.300.
Zuk, Paul, 4,404,234, Cl. 427-37.000.
Bellmann, Gunter; Cervini, Celeste; and Sachetto, Jean-Pierre, to Battelle Memorial Institute. Carboxymethylcellulose with carbonate bridges and preparation thereof. 4,404,371, Cl. 536-98.000.
Bellos, Thomas J., to Petrolite Corporation. Block polymers of alkanolamines. 4,404,362, Cl. 528-422.000.
Belokin, Paul, Jr. Variable display merchandising rack. 4,403,702, Cl. 211-189.000.
Benaroya, Henry. Free piston internal combustion engines. 4,403,577, Cl. 123-46.00R.
Bendix Corporation, The: *See*—
Harton, Donald L., 4,404,459, Cl. 219-209.000.
Benjamin, Harwell E.: *See*—
Johnson, Paul H.; and Benjamin, Harwell E., 4,404,178, Cl. 423-450.000.
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, to Patentbureau DANUBIA. Pyridazino[4,5-b]quinoxaline-5,10-dioxide derivatives, a process for preparing same and anti-microbial compositions containing same. 4,404,204, Cl. 424-250.000.
Bennett, Arthur J. R. Milking machine. 4,403,569, Cl. 119-14.180.
Berg, Richard. Latching portable personal security alarm. 4,404,549, Cl. 340-574.000.
Berger, Bernard B., to Ducane Heating Corporation. Heat trapping cooking grill. 4,403,541, Cl. 99-385.000.
Bergfeld, Manfred: *See*—
Zengel, Hans G.; and Bergfeld, Manfred, 4,404,401, Cl. 564-416.000.
Bergh, Daniel D.: *See*—
Koch, Robert E.; and Bergh, Daniel D., 4,404,614, Cl. 361-128.000.
Bergles, Eduard, to Fichtel & Sachs AG. Bicycle chain-shifting device. 4,403,977, Cl. 474-80.000.
Bergwerksverband GmbH: *See*—
Knoblauch, Karl; Richter, Ekkehard; Giessler, Klaus; and Korbacher, Werner, 4,404,004, Cl. 55-25.000.
Berlin, Irwin J.: *See*—
Bardenstein, Albert, 4,403,724, Cl. 227-76.000.
Berlin, J. Burton; and Schweizer, Erwin V., to Boeing Company, The. Bifurcated feel simulator for aircraft. 4,403,756, Cl. 244-223.000.
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, to STE Look. Ski brake. 4,403,788, Cl. 280-605.000.
Bernert, Claus-Rudiger; Hartwig, Volker; Kords, Christian; and Redeker, Detmar, to Wolff Walsrode AG and Bayer AG. Purification of cellulose and starch ethers with counter current washing. 4,404,370, Cl. 536-85.000.
Bernhagen, Wolfgang: *See*—
Cornils, Boy; Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,404,410, Cl. 568-858.000.
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, to Witco Chemical Corporation. Polyester resins for polyurethane foams. 4,404,295, Cl. 521-172.000.
Bernstein, Seymour: *See*—
Miner, Thomas G.; and Bernstein, Seymour, 4,404,365, Cl. 536-4.100.
Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, 4,404,195, Cl. 424-180.000.
Berri-Balzac: *See*—
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Bertellini, Gianfranco; and Fabbri, Luigi, to Sis-Ter S.p.A. Continuous peritoneal dialysis bag device. 4,403,992, Cl. 604-410.000.
Besasie, Joseph C.: *See*—
Pelt, Thomas E.; and Besasie, Joseph C., 4,404,434, Cl. 179-156.00R.
Bessaguet, Louis: *See*—
Astier, Jean-Francois; and Bessaguet, Louis, 4,404,449, Cl. 219-69.00V.
Beuneu, Pierre: *See*—
Credoz, Paul; and Beuneu, Pierre, 4,404,038, Cl. 127-60.000.
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Wheeler, Leon; and Beusch, Glenn A., 4,404,433, Cl. 179-7.1TP.
Beyl, Jean: *See*—
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, 4,403,788, Cl. 280-605.000.
Bezman, Susan A., to Chevron Research Company. Process for producing oxygenated fuels. 4,403,999, Cl. 44-56.000.
Bhatti, Mohinder S.; Marzocchi, Alfred; and Ritter, George W., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers. 4,404,009, Cl. 65-1.000.
BHS-Bayerische Berg-, Hutten-und Salzwerke: *See*—
Heidrich, Gunther; and Stolzle, Karl, 4,403,968, Cl. 440-3.000.
Bi, Le-Khac; Dillon, Mary E.; and Sharik, Clyde, to Atlantic Richfield Company. N,N-Dimethylacrylamide/2-acrylamido-2-methylpropane sulfonic acid copolymers for enhanced petroleum recovery. 4,404,111, Cl. 252-8.55D.
Biadigo, Mario: *See*—
Cuman, Giorgio; and Biadigo, Mario, 4,403,931, Cl. 425-84.000.
Biance, Michael P. Trailer hitch snow plow. 4,403,432, Cl. 37-235.000.
BICC PLC: *See*—
Dewhurst, Paul E.; and Collier, John C., 4,403,383, Cl. 29-33.00M.
Bickl, Horst: *See*—
Burger, Erich; Bickl, Horst; and Huber, Hans-Peter, 4,403,849, Cl. 355-8.000.
Bickley, Robert H.: *See*—
Genrich, Thad J.; and Bickley, Robert H., 4,404,531, Cl. 331-64.000.
Biddle, Howard W., to Cambridge Consultants Limited. Torque wrench. 4,403,530, Cl. 81-478.000.
Bieneck, Gunther, to Hasco-Normalien Hasenclever & Co. Coupling for tripartite injection or compression mold. 4,403,810, Cl. 425-589.000.
Bier, Peter, to Bayer Aktiengesellschaft. Process for injection molding a rapidly crystallizing polyethylene terephthalate composition at reduced mold temperatures. 4,404,161, Cl. 264-328.160.
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., to Kendall Company, The. Syringe assembly. 4,403,988, Cl. 604-118.000.
Binder, Hellmuth, to Daimler-Benz AG. Motor vehicle adapted for guidance along a track. 4,403,553, Cl. 104-245.000.
Binet, Rejean: *See*—
Yorke, William J.; Binet, Rejean; Lee, Ming C.; and Bampfield, Howard A., 4,404,050, Cl. 149-2.000.
BioSystems Research Inc.: *See*—
Lionelle, Joseph E.; and Staffa, Jeffrey A., 4,404,146, Cl. 260-429.900.
Biotek, Inc.: *See*—
Ash, Stephen R.; and Loeb, Marvin P., 4,403,984, Cl. 604-50.000.
Birch, Per; and Marcussen, Christian, to F. L. Smidth & Co. Apparatus for driving a rotary drum, such as a rotary kiln. 4,403,952, Cl. 432-103.000.
Blackmer, David E., to Kintek, Inc. Audio signal processing system. 4,404,427, Cl. 179-1.0VL.
Blakers, Andrew W.: *See*—
Green, Martin A.; and Blakers, Andrew W., 4,404,422, Cl. 136-255.000.
Blanco, Jeanne M.: *See*—
Blanco, Josephine; and Blanco, Jeanne M., 4,403,442, Cl. 46-163.000.
Blanco, Josephine; and Blanco, Jeanne M. Extendable nails for dolls. 4,403,442, Cl. 46-163.000.
Bland, Gerald F.; and Ladwig, Allen N., to Outboard Marine Corporation. Marine propulsion device including engine housing pump mechanism. 4,403,972, Cl. 440-88.000.
Blank, Werner J.: *See*—
Parekh, Girish G.; Blank, Werner J.; and Schirmann, Peter J., 4,404,332, Cl. 525-428.000.
Blaszuk, Paul R.: *See*—
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Bleiweiss, Arthur F.; and Base, Terence E., to Dominion Auto Accessories Limited. Emergency triangular road safety device. 4,403,565, Cl. 116-63.00T.
Bloothoofd, William, to Hercules Incorporated. Apparatus for producing a printing plate. 4,403,566, Cl. 118-407.000.
Blum, Ronald D. Tying device. 4,403,375, Cl. 24-16.0PB.
Bocharov, Boris V.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.
Boden, Richard M.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,404,307, Cl. 524-290.000.
Bodine, Albert G. Sonic system for propelling pilings, drills and the like into the earth employing screw device. 4,403,665, Cl. 175-55.000.

Bodyagina, Rashida G.: *See*—
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Boeing Company, The: *See*—
Berlin, J. Burton; and Schweizer, Erwin V., 4,403,756, Cl. 244-223.000.
Desjardins, Rene A., 4,403,681, Cl. 188-379.000.
Dickson, Jerald L.; and Green, Harvey E., Jr., 4,404,054, Cl. 156-92.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Thiourea derivatives having pesticidal activity. 4,404,225, Cl. 424-322.000.

Boguslaski, Robert C.; Burd, John F.; and Carrico, Robert J., to Miles Laboratories, Inc. Beta-galactosyl-umbelliferone-labeled hapten conjugates. 4,404,366, Cl. 536-18.100.

Boisde, Gilbert; Bonnejean, Claude; and Perez, Jean J., to Commissariat a l'Energie Atomique. Photometric analyzer for automatically studying complex solutions. 4,403,861, Cl. 356-407.000.

Bolen, Charles E.: *See*—
Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward L., 4,404,316, Cl. 524-522.000.

Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,403,444, Cl. 47-57.600.

Bolz, Gerhard: *See*—
Lach, Dietrich; Streicher, Rolf; and Bolz, Gerhard, 4,403,993, Cl. 8-94.240.

Bommeli, M. Bernard, to Ateliers des Charmilles S.A. Process and apparatus for gap control of an EDM apparatus. 4,404,448, Cl. 219-69.00G.

Bonacci, John J.; and Bonacci, Theresa S. Telephone lock. 4,404,435, Cl. 179-189.00R.

Bonacci, Theresa S.: *See*—
Bonacci, John J.; and Bonacci, Theresa S., 4,404,435, Cl. 179-189.00R.

Bonaldi, Antonio; Molinari, Egidio; and Springolo, Vanna, to Erregierre S.p.A. Salification products of cholic acids with trimethoxy-3,4,5-benzoic ester of 2-phenyl-2-dimenthylaminobutanol, having pharmacotherapeutic action, process for their preparation and therapeutic compositions containing them as active principle. 4,404,199, Cl. 424-238.000.

Bonar, David C., to North American Philips Corporation. Slit radiography. 4,404,591, Cl. 358-111.000.

Bongers, Bernd, to Messerschmitt-Bolkow Blohm Gesellschaft mit beschrankter Haftung. Connecting rod for an engine. 4,403,525, Cl. 74-579.00E.

Bonissone, Giancarlo; and Mulas, Piero, to F.I.P. Formatura Iniezione Polimeri S.p.A. Method and device for eliminating the feeder head portion injection moulding process. 4,404,160, Cl. 264-328.900.

Bonnejean, Claude: *See*—
Boisde, Gilbert; Bonnejean, Claude; and Perez, Jean J., 4,403,861, Cl. 356-407.000.

Boone, Didier; and Cousin, Rolf, to Siemens Aktiengesellschaft. Method and device for the measurement of the contact resistance of galvanic surface layers. 4,404,518, Cl. 324-62.000.

Booth, John A.: *See*—
Johnson, Lloyd H.; Couchman, Robert S.; Spencer, Robert C., Jr.; Booth, John A.; and Holman, Russell J., 4,403,476, Cl. 60-652.000.

Boothe, James H.; and Ross, Adma S., to American Cyanamid Company. Cephalosporanic acid derivatives. 4,404,374, Cl. 544-26.000.

Boothe, James H.; and Ross, Adma S., to American Cyanamid Company. Cephalosporanic acid derivatives. 4,404,375, Cl. 544-27.000.

Boothe, James H.; and Ross, Adma S., to American Cyanamid Company. Cephalosporanic acid derivatives. 4,404,376, Cl. 544-27.000.

Bopp, Richard C.: *See*—
Abolins, Visvaldis; Bopp, Richard C.; Caraher, Joel M.; and Lovgren, Eric M., 4,404,125, Cl. 252-511.000.

Boretos, John W., to United States of America, Health and Human Services. Jet controlled catheter. 4,403,985, Cl. 604-53.000.

Bornstein, Leopold F., to Georgia-Pacific Corporation. Thermosetting resinous polyol. 4,404,334, Cl. 525-504.000.

Bortignon, Renzo: *See*—
Belforte, Piero; and Bortignon, Renzo, 4,404,630, Cl. 364-200.000.

Bossek, Harald: *See*—
Osberghaus, Rainer; Ellwanger, Hans; Marsen, Horst; and Bossek, Harald, 4,404,039, Cl. 134-3.000.

Bottenbruch, Ludwig: *See*—
Freitag, Dieter; Serini, Volker; Goossens, John; Bottenbruch, Ludwig; and Hucks, Uwe, 4,404,363, Cl. 528-486.000.

Bottka, Nicholas; and Hills, Marian E., to United States of America, Navy. Method of making avalanche photodiodes. 4,403,397, Cl. 29-572.000.

Boudot, Jean E., to Corning Glass Works. Glasses of high refractive index, low dispersion, and low density. 4,404,290, Cl. 501-78.000.

Boutin, Jean: *See*—
Bartissol, Alain; Boutin, Jean; and Wachowski, Francois, 4,404,073, Cl. 204-159.230.

Bowen, John G.; and Kovalenko, Eugene N. Spare tank system for motor vehicle. 4,403,589, Cl. 123-525.000.

Bower, Raymond M.; and Allard, Jules N., to Bush Universal, Inc. Techniques for stripping a sleeve from resin impregnated fibrous rovings. 4,403,361, Cl. 12-142.00R.

Bowers, Homer C.: *See*—
Munsterman, Ronald S.; and Bowers, Homer C., 4,403,489, Cl. 72-16.000.

Boyd, James W.: *See*—
deWalle, Stewart; Hamoen, Dirk W.; and Boyd, James W., 4,403,510, Cl. 73-644.000.

Bozsing, Daniel: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,404,204, Cl. 424-250.000.

Bradley, Gerald R. Buffer valve. 4,403,627, Cl. 137-508.000.

Brattsand, Ralph L.: *See*—
Thalen, Bror A.; and Brattsand, Ralph L., 4,404,200, Cl. 424-241.000.

Braun, Ernst: *See*—
Braun, Gert; and Braun, Ernst, 4,403,808, Cl. 299-34.000.

Braun, Gert; and Braun, Ernst, to Halbach and Braun. Hauling and shaving plant. 4,403,808, Cl. 299-34.000.

Braun, Konrad: *See*—
Becker, Udo; Braun, Konrad; and Heimburger, Norbert, 4,404,134, Cl. 260-112.50R.

Braun, Peter. Wire basket, apparatus and method. 4,403,447, Cl. 47-76.000.

Breining, Tibor: *See*—
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,404,205, Cl. 424-251.000.

Breuer, Oswald: *See*—
Hauschopp, Alois; Breuer, Oswald; and Steinkuhl, Bernd, 4,403,809, Cl. 299-34.000.

Bricheno, Terry; Robertson, Alexander J.; and Finlay, Ross K., to International Standard Electric Corporation. Replacing optical fibre sheathing after fusion splicing. 4,404,010, Cl. 65-4.200.

Bridges, James R., to Halliburton Company. Neutron generator tube ion source control system. 4,404,163, Cl. 376-119.000.

Bridgewater, Bobbie D.: *See*—
Young, Robert E.; and Bridgewater, Bobbie D., 4,403,579, Cl. 123-146.50A.

Briscoe, James E.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,404,377, Cl. 544-87.000.

Bromine Compounds Ltd.: *See*—
Fishler, Theodor; Ravey, Manny; and Shorr, Leonard M., 4,404,297, Cl. 523-179.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; Jozuka, Masao; and Sakaida, Atsuo, 4,403,875, Cl. 400-124.000.
Hirose, Mitsuhiro, 4,403,559, Cl. 112-121.120.

Broughton, Donald B., to UOP Inc. Sucrose extraction from aqueous solutions featuring simulated moving bed. 4,404,037, Cl. 127-55.000.

Brown, James H.: *See*—
Grande, Johannes; and Brown, James H., 4,404,677, Cl. 371-69.000.

Brown, Michael R.: *See*—
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Brown, Robert S.; and O'Neill, John H., Jr., to Miliken Research Corporation. Yarn pad. 4,403,367, Cl. 15-230.120.

Brunswick Corporation: *See*—
Baker, Alan C.; Shiovitz, Nathan N.; and Whiting, George E., 4,403,435, Cl. 42-1.00F.

Brush, John D.: *See*—
Wilkinson, Dawn G.; and Brush, John D., 4,403,807, Cl. 297-217.000.

Brusnikina, Vera M.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.

Bryan, David A.; and Powers, John K., to McDonnell Douglas Corporation. Process for producing a diffraction grating. 4,403,827, Cl. 350-162.170.

BSD Medical Inc.: *See*—
Turner, Paul F.; and Gandhi, Om P., 4,403,618, Cl. 128-804.000.

Buck, James R., to Buck Tool Company. Push-type jaw chuck. 4,403,782, Cl. 279-121.000.

Buck Tool Company: *See*—
Buck, James R., 4,403,782, Cl. 279-121.000.

Bucklers, Lothar: *See*—
Sporkenbach, Jutta; Eggensperger, Heinz; Bucklers, Lothar; Ehlers, Helmut H.; Eigener, Ulrich; and Harke, Hans-Peter, 4,404,191, Cl. 424-130.000.

Budzik, Gerald P.: *See*—
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,404,188, Cl. 424-105.000.

Buelens, Edward; and Goossens, Carolus C., to Agfa-Gevaert N.V. Cassette for holding and dispensing a roll of web material. 4,403,845, Cl. 354-275.000.

Bugay, Al: *See*—
Hughes, Michael G.; Tenenbaum, Radu R.; and Bugay, Al, 4,404,523, Cl. 324-207.000.

Builders Equipment Company: *See*—
Thomas, Paul M., 4,403,900, Cl. 414-137.000.

Bunes, Leonard A.: *See*—
Stephenson, Rebecca A. G.; Dietrich, Paul S.; DuBois, Grant E.; and Bunes, Leonard A., 4,404,367, Cl. 536-18.100.

Bunnell Plastics, Incorporated: *See—*
Curran, Donald G.; and Anderson, Robert A., 4,403,794, Cl. 285-45.000.

Burd, John F.: *See—*
Boguslaski, Robert C.; Burd, John F.; and Carrico, Robert J., 4,404,366, Cl. 536-18.100.

Bure, Jacques: *See—*
Vincent, Michel; Remond, Georges; and Bure, Jacques, 4,404,215, Cl. 424-267.000.

Burger, Erich; Bickl, Horst; and Huber, Hans-Peter, to Agfa-Gevaert AG. Electrostatic copying device. 4,403,849, Cl. 355-8.000.

Burgin, Ralph; and Dadant, Timothy C., to Dadant & Sons, Inc. End bar. 4,403,358, Cl. 6-10.000.

Burndy Corporation: *See—*
Dewhurst, Paul E.; and Collier, John C., 4,403,383, Cl. 29-33.00M.

Burns, Joseph R.: *See—*
Taylor, George W.; and Burns, Joseph R., 4,404,490, Cl. 310-339.000.

Burroughs Corporation: *See—*
Grow, Robert M., 4,404,557, Cl. 340-825.050.
Kocot, Ray H.; Rudd, Robert E., III; and Arnoldi, Douglas R., 4,404,573, Cl. 346-140.00R.

Burroughs Wellcome Co.: *See—*
Matthewson, Michael D., 4,404,223, Cl. 424-304.000.
Moncada, Salvador E., 4,404,212, Cl. 424-251.000.

Burt, Howard N. M. Waste pipe support apparatus. 4,403,758, Cl. 248-49.000.

Burwasser, Herman; and Wyhof, John R., to R.Q.O. Holding Company, Inc. Electrographic printing system using dielectric film member. 4,404,574, Cl. 346-153.100.

Busche, William W., to IVAC Corporation. Apparatus for detecting when the pressure detector in a fluid line exceeds a prescribed threshold. 4,404,440, Cl. 200-83.00R.

Bush, Charles N.; and Doyle, Thomas J., to B. F. Goodrich Company, The. Suspension polymerization process for making vinyl resins for use in plastisols. 4,404,339, Cl. 526-88.000.

Bush Universal, Inc.: *See—*
Bower, Raymond M.; and Allard, Jules N., 4,403,361, Cl. 12-142.00R.

Butaev, Erkin M.: *See—*
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Butterworth, Arthur L.; and Utter, Robert E., to Trane Company, The. Lubricant distribution system for scroll machine. 4,403,927, Cl. 418-55.000.

C-I-L Inc.: *See—*
Yorke, William J.; Binet, Rejean; Lee, Ming C.; and Bampfield, Howard A., 4,404,050, Cl. 149-2.000.

C. M. Industries: *See—*
Demarne, Henri; and Wagnon, Jean, 4,404,217, Cl. 424-274.000.

Cabanaw, Eldred J.; and Mann, John W., to Phillips Petroleum Company. Alkylation process. 4,404,419, Cl. 585-723.000.

Cael, John J., to International Paper Company. Bleaching of lignocellulosic materials with monopersulfuric acid or its salts. 4,404,061, Cl. 162-76.000.

Calabuig Sanchis, Maria A.: *See—*
Rivelles Sabater, Maria D.; Alcala Perales, Maria T.; Manes Uso, Carmen; and Calabuig Sanchis, Maria A., 4,403,637, Cl. 150-12.000.

Caldwell, David L.; and Schelling, Edward C., to General Motors Corporation. Vehicle floor mat retainer. 4,403,895, Cl. 411-378.000.

California Sounds Ltd.: *See—*
Sandor, Joseph; and Davis, Claude P., 4,403,880, Cl. 401-134.000.

Calmac Manufacturing Corporation: *See—*
MacCracken, Calvin D., 4,403,645, Cl. 165-10.000.

Cambridge Chemical Products, Inc.: *See—*
Mauthner, Thomas, 4,404,181, Cl. 424-3.000.

Cambridge Consultants Limited: *See—*
Biddle, Howard W., 4,403,530, Cl. 81-478.000.

Campbell, Richard H., Jr.; and Noyes, John B., to Wilcom Products, Inc. Phasor impedance measuring test set. 4,404,636, Cl. 364-482.000.

Campen, Kenneth W., to Tecumseh Products Company. Economical flywheel alternator for trickle charging a small lawnmower battery. 4,404,513, Cl. 322-90.000.

Campillo, Christian: *See—*
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, 4,403,788, Cl. 280-605.000.

Campolmi, Stefano: *See—*
Cigna, Giuseppe; Catarsi, Paolo; Mussatto, Maria C.; Vivaldini, Fabrizio; and Campolmi, Stefano, 4,404,293, Cl. 521-56.000.

Cann, Gordon L. Micro-arc welding/brazing of metal to metal and metal to ceramic joints. 4,404,456, Cl. 219-137.0PS.

Canning, John L.; and Kay, John F., to Owens-Corning Fiberglas Corporation. Method of molding multi-ply polymeric composites including simultaneous curing of plural layers having different catalyst polymerization initiation temperatures and product thereof. 4,404,261, Cl. 428-480.000.

Canon Kabushiki Kaisha: *See—*
Kitamura, Takashi, 4,404,571, Cl. 346-108.000.
Masuda, Shunichi, 4,403,850, Cl. 355-14.00R.
Nakagawa, Katsumi; and Fukada, Tadaji, 4,404,076, Cl. 204-164.000.
Namai, Akihiro, 4,403,844, Cl. 354-234.000.
Okamura, Shigeru; Kyogoku, Hiroshi; and Tazaki, Shigemitsu, 4,404,572, Cl. 346-140.00R.
Uchiro, Tatsuzo; and Takimoto, Hiroyuki, 4,404,595, Cl. 358-227.000.
Yamada, Tateo; Mamiya, Toshiharu; and Ikawa, Kazuo, 4,404,618, Cl. 362-17.000.

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Capizzi, Amedeo: *See—*
Maccone, Sergio; Dal Moro, Anacleto; Pirozzi, Mario; and Capizzi, Amedeo, 4,404,185, Cl. 424-84.000.

Caraher, Joel M.: *See—*
Abolins, Visvaldis; Bopp, Richard C.; Caraher, Joel M.; and Lovgren, Eric M., 4,404,125, Cl. 252-511.000.

Cardwell, John A. Anti-theft device or system for vehicles. 4,403,675, Cl. 180-287.000.

Care, Donald E.; and Metzger, Edward L., to E & D Specialty Stands, Inc. Rod storage rack. 4,403,698, Cl. 211-60.00S.

Carl Zeiss-Stiftung: *See—*
Lang, Walter H.; and Muchel, Franz, 4,403,841, Cl. 351-215.000.

Carlo Erba Strumentazione S.p.A.: *See—*
Sisti, Giorgio; Tosi, Bruno; Trestianu, Sorin; and Galli, Mario, 4,403,520, Cl. 73-864.810.

Carlson, Gerald I.; and Cook, Norman J. Automobile support rack. 4,403,716, Cl. 224-42.080.

Carrico, Robert J.: *See—*
Boguslaski, Robert C.; Burd, John F.; and Carrico, Robert J., 4,404,366, Cl. 536-18.100.

Carrier Corporation: *See—*
Copenhaver, Lloyd F., 4,403,599, Cl. 126-312.000.
Copenhaver, Lloyd F., 4,403,942, Cl. 431-24.000.

Carson, Ray: *See—*
Raymoure, Russell A.; Bechtel, Richard P., Jr.; Carson, Ray; and Don Carlos, Alva G., 4,403,695, Cl. 206-497.000.

Cartheuser, Carl: *See—*
Gebert, Ulrich; Thorwart, Werner; Komarek, Jaromir; and Cartheuser, Carl, 4,404,384, Cl. 544-394.000.

Cartoceti, Italiano, to CIR S.p.A. Divisione Sasib. Method for the emptying of cigarette trays into magazines. 4,403,908, Cl. 414-786.000.

Cary, Arthur P. Extension member for surrogate forks for a fork lift truck. 4,403,903, Cl. 414-607.000.

Cash, Dennis R.: *See—*
Bachtel, Robert W.; and Cash, Dennis R., 4,404,088, Cl. 208-59.000.

Cashwell, Ernest, to Philip Morris Incorporated. Optical perforating apparatus and system. 4,404,452, Cl. 219-121.0LK.

Cassella Aktiengesellschaft: *See—*
Cornelius, Dieter, 4,403,995, Cl. 8-652.000.

Cassola, Adrian: *See—*
Koski, Unto K.; Khalil, Hamdy; and Cassola, Adrian, 4,404,300, Cl. 524-91.000.

Castelli, Vittorio R.: *See—*
Jones, John E.; and Castelli, Vittorio R., 4,403,877, Cl. 400-335.000.

Casteras, John E.: *See—*
Di Martini, Carl R.; and Casteras, John E., 4,404,026, Cl. 75-63.000.

Castillo, Carmen; and Hayes, John C., to UOP Inc. Passivation of metal contaminants on cracking catalyst. 4,404,090, Cl. 208-120.000.

Castle, Thomas M.: *See—*
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Catarsi, Paolo: *See—*
Cigna, Giuseppe; Catarsi, Paolo; Mussatto, Maria C.; Vivaldini, Fabrizio; and Campolmi, Stefano, 4,404,293, Cl. 521-56.000.

Caterpillar Tractor Co.: *See—*
Gladden, John R., 4,403,473, Cl. 60-274.000.
Huff, Edward R.; and Warner, Hubert H., 4,403,801, Cl. 294-93.000.
Styok, Wayne G., 4,403,648, Cl. 165-76.000.

Cates, Allen E. Additive for drilling fluids. 4,404,108, Cl. 252-8.50A.

Cauchy, Charles J. Water heating apparatus for solid fuel firebox. 4,403,573, Cl. 122-20.00A.

Caudy, Don W.; Hackman, Donald J.; Hoffman, Robert T.; and Uhler, Dale G., to United States of America, Navy. Instantaneous start and stop gas generator. 4,404,170, Cl. 422-237.000.

Cave, Eric F.; and Cowden, James J., to RCA Corporation. Stylus coning fixture. 4,403,453, Cl. 51-124.00R.

Cavitt, Michael B., to Dow Chemical Company, The. Hydrolyzing epoxy resins in absence of solvent and in presence of oxalic acid and a phosphonium compound. 4,404,335, Cl. 525-507.000.

Celanese Corporation: *See—*
Finney, Michael L.; Moates, Danny; and Brown, Michael R., 4,403,360, Cl. 8-151.000.
Kuder, James E., 4,404,070, Cl. 204-72.000.

Cemen, Tech, Inc.: *See—*
Stastny, Joseph F., 4,403,864, Cl. 366-19.000.

Central Electricity Generating Board of Sudbury House: *See—*
Marshall, Geoffrey B.; and Midgley, Derek, 4,404,287, Cl. 436-109.000.

Cerberus AG: *See—*
Mueller, Peter; Schibli, Eugen; Scheidweiler, Andreas; and Muggli, Jurg, 4,404,548, Cl. 340-505.000.

Cervini, Celeste: *See—*
Bellmann, Gunter; Cervini, Celeste; and Sachetto, Jean-Pierre, 4,404,371, Cl. 536-98.000.

Cesark, Frank F.; Manfre, Robert J.; and Thomas, Daniel W., to American Cyanamid Company. Novel glycolic acid esters and amides of bis(p-disubstitutedaminophenyl)carbinol. 4,403,792, Cl. 282-27.500.
Chakrabarti, Jiban K.; and Hottea, Terrence M., to Lilly Industries Limited. Pyrazolo [3,4-b][1,5]benzodiazepine compounds. 4,404,137, Cl. 260-239.30T.
Chaloka, Andrew: *See—*
Herschel, Ben B.; and Chaloka, Andrew, 4,403,649, Cl. 165-101.000.
Chambu, Claude: *See—*
Tellier, Jacques; Chambu, Claude; Coste, Jean-Francois; and Grangette, Henri, 4,404,109, Cl. 252-8.55D.
Champion International Corporation: *See—*
Faller, Rudolph A., 4,403,548, Cl. 101-372.000.
Fogle, Ozzie, 4,403,384, Cl. 29-130.000.
Chang, Daniel M., to B. F. Goodrich Company, The. Precrosslinked nitrile rubber polymer blends with linear polymers. 4,404,326, Cl. 525-223.000.
Channing, Christopher P.; and Rovinsky, William Z., to Flair Manufacturing Corp. Double switch fuse assembly. 4,404,613, Cl. 361-104.000.
Chao, Robert L., to Supertex, Inc. Detection circuit and structure therefor. 4,404,477, Cl. 307-297.000.
Chapman, Marion J.: *See—*
Chapman, Marion R., Jr.; and Chapman, Marion J., 4,403,428, Cl. 37-57.000.
Chapman, Marion R., Jr.; and Chapman, Marion J. Suction dredge cutter head. 4,403,428, Cl. 37-57.000.
Chaput, Joseph R. Random indicia selector. 4,403,775, Cl. 273-144.00B.
Charbonneau, Robert R.; and Groff, Gaylord L., to Minnesota Mining and Manufacturing Company. Storable, crosslinkable pressure-sensitive adhesive tape. 4,404,246, Cl. 428-212.000.
Chatterji, Dulal C.: *See—*
Vermess, Michael; Chatterji, Dulal C.; Grimes, George J., Jr.; and Gallelli, Joseph F., 4,404,182, Cl. 424-5.000.
Chelin, Charles R., to Towmotor Corporation. Lift truck guide assembly. 4,403,904, Cl. 414-634.000.
Chemap AG: *See—*
Muller, Hans; and Guazzone, Bruno, 4,404,106, Cl. 210-772.000.
CHEMOKOL Gesellschaft zur Entwicklung von Kollagenprodukten: *See—*
Steffan, Wolfgang, 4,404,033, Cl. 106-161.000.
Chemplex Company: *See—*
Hoff, Raymond E., 4,404,343, Cl. 526-142.000.
Chepkalenko, Mikhail G.: *See—*
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.
Cherney, Jerome A.: *See—*
Mueller, Robert L.; and Cherney, Jerome A., 4,404,241, Cl. 428-35.000.
Cherry, Peter J., to Marconi Company Limited, The. Stabilized power supply. 4,404,622, Cl. 363-27.000.
Chevron Research Company: *See—*
Bachtel, Robert W.; and Cash, Dennis R., 4,404,088, Cl. 208-59.000.
Bezman, Susan A., 4,403,999, Cl. 44-56.000.
Fraas, Lewis M., 4,404,421, Cl. 136-249.000.
McGuire, John F.; Hurt, J. Steven; and Wilkerson, Ronald L., 4,404,639, Cl. 364-551.000.
Ploeg, Johan F.; and Oden, Arlo L., 4,403,656, Cl. 166-179.000.
Chiasson, Robert H. Belt grinder for sharpening ice skate blades and the like. 4,403,455, Cl. 51-141.000.
Chicago Pneumatic Tool Company: *See—*
Wallace, William K.; and Giardino, David A., 4,403,532, Cl. 81-483.000.
Chicago Province of the Society of Jesus: *See—*
Skelskey, David A., 4,403,916, Cl. 416-14.000.
Chichibu Cement Kabushikikaisha: *See—*
Sudoh, Giichi; Minegishi, Keiichi; Ishizaki, Kanjiro; and Uchida, Ikuo, 4,404,031, Cl. 106-90.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT.: *See—*
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,404,205, Cl. 424-251.000.
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,404,189. Cl. 424-114.000.
Chiu, Pay H.; and Desroziers, Andre J., to Photochemical Research Associates Inc. Dye cell holder for dye laser. 4,404,679, Cl. 372-54.000.
Cho, Kyu S. Self teaching instrument. 4,403,967, Cl. 434-337.000.
Chrestensen, Gene L., to Eastman Kodak Company. Electrographic transfer apparatus. 4,403,847, Cl. 355-3.0TR.
Christensen, Terrence B.; McNaughton, Allen D.; and Umbach, Steven R., to Syntex (U.S.A.) Inc. Injection device. 4,403,989, Cl. 604-137.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Catalysts for para-ethyltoluene dehydrogenation. 4,404,123, Cl. 252-463.000.
Chupp, John P.: *See—*
Goodin, Richard D.; Chupp, John P.; Balthazor, Terry M.; and Coleman, James P., 4,404,069, Cl. 204-59.00R.
Ciarico, Anthony J.: *See—*
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,403,988, Cl. 604-118.000.
Ciba-Geigy AG: *See—*
Forte, Eddy; Fryberg, Mario; and Jan, Gerald, 4,404,273, Cl. 430-377.000.
Ciba-Geigy Corporation: *See—*
Andrews, Christopher M., 4,404,356, Cl. 528-99.000.
Babler, Fridolin, 4,404,385, Cl. 546-37.000.
Babler, Fridolin, 4,404,386, Cl. 546-37.000.
Boger, Manfred; and Drabek, Jozef, 4,404,225, Cl. 424-322.000.
Eldin, Sameer H.; and Schreiber, Bruno, 4,404,355, Cl. 528-89.000.
Fah, Hansjakob; and Grieder, Alfred, 4,404,388, Cl. 546-345.000.
Schurter, Rolf; Clauson-Kaas, Niels; and Rempfler, Hermann, 4,404,020, Cl. 71-94.000.
Wirth, Hermann O.; and Friedrich, Hans-Helmut, 4,404,408, Cl. 568-680.000.
Wurster, Rudolf F.; and Merz, Jurg, 4,404,104, Cl. 210-684.000.
Cigna, Giuseppe; Catarsi, Paolo; Mussatto, Maria C.; Vivaldini, Fabrizio; and Campolmi, Stefano, to Montedison S.p.A. Self-extinguishing expandable polystyrene particles having an improved processability. 4,404,293, Cl. 521-56.000.
Cimenti, Antonio: *See—*
Zamparelli, Walter; Cimenti, Antonio; and Muscariello, Giuseppe, 4,403,937, Cl. 425-337.000.
CIR S.p.A. Divisione Sasib: *See—*
Cartoceti, Italiano, 4,403,908, Cl. 414-786.000.
Pezzi, Giovanni, 4,403,501, Cl. 73-38.000.
Citizen Watch Company Limited: *See—*
Enomoto, Tadao, 4,404,067, Cl. 204-4.000.
Nakajima, Fumio, 4,404,510, Cl. 318-696.000.
Clark, Carl A., to Eastern Company, The. Rock bolt expansion anchor having windened expansion range. 4,403,894, Cl. 411-47.000.
Clark Equipment Company: *See—*
Sapelak, Ronald, 4,403,902, Cl. 414-569.000.
Clark, Frederic L.; and Ayers, Scott D., to Mead Corporation, The. Fluid system for fluid jet printing device. 4,404,566, Cl. 346-1.100.
Clark, Noel A.: *See—*
Rothschild, Kenneth J.; and Clark, Noel A., 4,403,939, Cl. 425-425.000.
Clarke, Theodore R., to Formica Corporation. Fire-retardant high pressure consolidated articles containing an air-laid web and method of producing same. 4,404,250, Cl. 428-220.000.
Clauson-Kaas, Niels: *See—*
Schurter, Rolf; Clauson-Kaas, Niels; and Rempfler, Hermann, 4,404,020, Cl. 71-94.000.
Clayton, Ralph S. Colon cleansing system and technique. 4,403,982, Cl. 604-28.000.
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Process for separating fatty acids from rosin acids. 4,404,145, Cl. 260-419.000.
Cloosterman, Aloysius B. M.; and Kranenburg, Simon V., to Internationale Octrooi Maatschappij "Octropa" B.V. Lipid and protein containing material in particulate form and process therefor. 4,404,228, Cl. 426-98.000.
Cobler, John A.: *See—*
Schulz, Johann G. D.; and Cobler, John A., 4,403,998, Cl. 44-51.000.
Coburn Optical Industries, Inc.: *See—*
Rarick, Kimber W., 4,403,420, Cl. 33-174.00A.
Cogswell, James A., II; and Malen, Donald E., to General Motors Corporation. Low force transmissibility mount. 4,403,762, Cl. 248-559.000.
Cohen, Edgar C. Vacuum-compression injector. 4,403,609, Cl. 604-70.000.
Cohen, Robert E.: *See—*
Anand, Madhu; Baddour, Raymond F.; and Cohen, Robert E., 4,404,256, Cl. 428-409.000.
Cohen, Solomon E.: *See—*
Seach, Barry G.; Muller, Hans; and Cohen, Solomon E., 4,403,938, Cl. 425-393.000.
Cohnen, Wolfgang: *See—*
Kafer, Peter; Morbitzer, Leo; Neuray, Dieter; Cohnen, Wolfgang; and Nouvertne, Werner, 4,404,351, Cl. 528-174.000.
Coleman, James P.: *See—*
Goodin, Richard D.; Chupp, John P.; Balthazor, Terry M.; and Coleman, James P., 4,404,069, Cl. 204-59.00R.
Colgate-Palmolive Company: *See—*
Mark, Reuben, 4,403,623, Cl. 132-84.00R.
Collier, John C.: *See—*
Dewhurst, Paul E.; and Collier, John C., 4,403,383, Cl. 29-33.00M.
Colvin, Floyd W.: *See—*
Hu, Mae W.; Colvin, Floyd W.; and Ullman, Edwin F., 4,404,278, Cl. 435-7.000.
Combustion Engineering, Inc.: *See—*
Kochey, Edward L., Jr., 4,403,571, Cl. 122-1.00A.
Commissariat a l'Energie Atomique: *See—*
Boisde, Gilbert; Bonnejean, Claude; and Perez, Jean J., 4,403,861, Cl. 356-407.000.
Fitoussi, Richard; and Musikas, Claude, 4,404,130, Cl. 252-631.000.
Commonwealth of Australia: *See—*
Dean, Stanley K.; and Dow, Robert, 4,404,507, Cl. 318-570.000.
Commonwealth Scientific Corporation: *See—*
daCosta, Harry; Howerton, Hugh K.; Hughes, William E.; and Monk, Gaines W., 4,403,567, Cl. 118-500.000.
Communications Satellite Corporation: *See—*
Rhodes, Smith A., 4,404,674, Cl. 371-43.000.
Welti, George R., 4,404,532, Cl. 332-17.000.

Connor, David T.; Schwender, Charles F.; Sorenson, Roderick J.; and Unangst, Paul C., to Warner-Lambert Company. 3-[2-(Azabicyclo) ethyl]-1,2,3,4-tetrahydro-5H-[1]benzopyrano[3,4-c]pyridin-5-ones. 4,404,138, Cl. 260-244.400.

Connor, John T., to West Company, The. Combination container cap and closure seal. 4,403,707, Cl. 215-253.000.

Continental Disc Corporation: *See*—
Paul, Herman L., Jr., 4,403,626, Cl. 137-68.00R.

Continental Group, Inc., The: *See*—
Krishnamumar, Suppayan M.; and Jolly, Walter R., 4,403,940, Cl. 425-529.000.
Mahajan, Gautam K., 4,403,706, Cl. 215-1.00C.

Continental-Wirt Electronics Corporation: *See*—
Quigley, Thomas J., 4,404,437, Cl. 200-16.00C.

Cook, Norman J.: *See*—
Carlson, Gerald I.; and Cook, Norman J., 4,403,716, Cl. 224-42.080.

Cookson, Dennis: *See*—
Howse, Peter; Cookson, Dennis; and Lane, Stephen P., 4,404,551, Cl. 340-711.000.

Coone, Malcolm G., to MGC Oil Tools, Inc. Well packer and method of use thereof. 4,403,660, Cl. 166-387.000.

Coope, Robert L., to Stevens Engineering, Inc. Slide mechanism. 4,403,389, Cl. 29-561.000.

Cooper Industries, Inc.: *See*—
King, William A.; and Kincaid, John W., 4,404,424, Cl. 174-34.000.
Snider, Philip A., 4,403,679, Cl. 184-64.000.

Copenhaver, Lloyd F., to Carrier Corporation. Spillage damper for a combustion system. 4,403,599, Cl. 126-312.000.

Copenhaver, Lloyd F., to Carrier Corporation. Self-checking safety switch control circuit. 4,403,942, Cl. 431-24.000.

Corcoran, Patrick G. Expansible rack for locker baskets and garment storage. 4,403,701, Cl. 211-133.000.

Corlett, Alan H.: *See*—
Schiltz, Ronald M.; and Corlett, Alan H., 4,403,652, Cl. 165-167.000.

Cornelius, Dieter, to Cassella Aktiengesellschaft. Sulphur dyestuffs, a process for their manufacture and their use from hydroxy-diphenylamine compounds. 4,403,995, Cl. 8-652.000.

Cornell, Robert W., to Griffith-Hope Company. Dispenser for coiled material having improved transfer mechanism. 4,403,748, Cl. 242-55.530.

Cornet, Jean, to Thomson-CSF. Thermo-optical data writing process and data medium for performing this process. 4,404,656, Cl. 365-126.000.

Cornils, Boy; Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, to Ruhrchemie Aktiengesellschaft. Process for preparing 2,3-dimethyl-2,3-butanediol. 4,404,410, Cl. 568-858.000.

Corning Glass Works: *See*—
Boudot, Jean E., 4,404,290, Cl. 501-78.000.

Coste, Jean-Francois: *See*—
Tellier, Jacques; Chambu, Claude; Coste, Jean-Francois; and Grangette, Henri, 4,404,109, Cl. 252-8.55D.

Costinescu-Tataranu, Alexander-Barbu: *See*—
Gloria, Karl; Costinescu-Tataranu, Alexander-Barbu; Schuster, Wilhelm; and Wittekind, Jurgen, 4,403,887, Cl. 405-53.000.

Couchman, Robert S.: *See*—
Johnson, Lloyd H.; Couchman, Robert S.; Spencer, Robert C., Jr.; Booth, John A.; and Holman, Russell J., 4,403,476, Cl. 60-652.000.

Coulter Systems Corporation: *See*—
Torto, Nicholas L.; and Di Nallo, Samuel R., Sr., 4,403,856, Cl. 355-75.000.

Cousin, Rolf: *See*—
Boone, Didier; and Cousin, Rolf, 4,404,518, Cl. 324-62.000.

Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., to Venture Chemicals, Inc. Well working compositions, method of decreasing the seepage loss from such compositions, and additive therefor. 4,404,107, Cl. 252-8.50M.

Cowden, James J.: *See*—
Cave, Eric F.; and Cowden, James J., 4,403,453, Cl. 51-124.00R.

Cox, Ernest R.; and Snyder, Duane E., Jr., to Firestone Tire & Rubber Company, The. High accuracy slitter system. 4,403,533, Cl. 83-56.000.

Coynel, Daniel; and Roussigne, Maurice, to Thomson-CSF. Electromagnetic relay. 4,404,443, Cl. 200-147.00A.

Cramer, Jurgen; Pistorius, Rudolf; and Mitzlaff, Michael, to Hoechst Aktiengesellschaft. Bipolar electrode for anodic processes in undivided cells. 4,404,082, Cl. 204-290.00R.

Crane Packing Limited: *See*—
Wilkinson, Samual C. W., 4,403,779, Cl. 277-27.000.

Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., to International Business Machines Corp. Electrically alterable read only memory cell. 4,404,577, Cl. 357-23.000.

Cranston Machinery Company, Inc.: *See*—
Lewis, Charles B., 4,403,542, Cl. 100-2.000.

Credoz, Paul; and Beuneu, Pierre, to Fives-Cail Babcock. Process and installation for producing lactose crystals. 4,404,038, Cl. 127-60.000.

Crepaco, Inc.: *See*—
Schiltz, Ronald M.; and Corlett, Alan H., 4,403,652, Cl. 165-167.000.

Critikon, Inc.: *See*—
Osborn, John J., 4,403,514, Cl. 73-861.520.

Cross, Barrington: *See*—
Ladner, David W.; and Cross, Barrington, 4,404,402, Cl. 564-442.000.

Crossley, Jack; and Wilson, David H., to Manesty Machines Limited. Tabletting machines. 4,403,935, Cl. 425-210.000.

Crugnola, Aldo M.; and Ellis, Edward J. Orthopaedic cement from acrylate polymers. 4,404,327, Cl. 525-228.000.

Crutcher, William C., to Timex Corporation. Electro-optic identifiction code system in a timepiece. 4,403,869, Cl. 368-10.000.

CSELT-Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See*—
Belforte, Piero; and Bortignon, Renzo, 4,404,630, Cl. 364-200.000.

Cuffia, Robert P., to Singer Company, The. Landing light pattern generator for simulator with selective addressing of memory. 4,404,553, Cl. 340-728.000.

Cuman, Giorgio; and Biadigo, Mario, to Ideal Standard S.p.A. Semi-automatic plant for manufacturing shaped concave vitreous china objects. 4,403,931, Cl. 425-84.000.

Curran, Donald G.; and Anderson, Robert A., to Bunnell Plastics, Incorporated. Safety shield for flanged pipe couplings. 4,403,794, Cl. 285-45.000.

Curran, Patrick A., to Texas Instruments Incorporated. Monolithic integration of logic, control and high voltage interface circuitry. 4,403,395, Cl. 29-571.000.

Curtiss-Wright Corporation: *See*—
Jones, Charles, 4,403,928, Cl. 418-60.000.

Custode, Frank Z.: *See*—
Tam, Matthias L.; and Custode, Frank Z., 4,404,581, Cl. 357-59.000.

Cutter Laboratories, Inc.: *See*—
Mitra, Gautam, 4,404,132, Cl. 260-112.00B.

Cyclone International Incorporated: *See*—
Freehafer, Donald H., 4,403,570, Cl. 119-72.500.

Czelusniak, Paul A., Jr., to Fieldcrest Mills, Inc. Woven pile fabric. 4,403,633, Cl. 139-402.000.

Dabi, Shmuel: *See*—
Loewrigkeit, Peter; and Dabi, Shmuel, 4,404,258, Cl. 428-424.600.

daCosta, Harry; Howerton, Hugh K.; Hughes, William E.; and Monk, Gaines W., to Commonwealth Scientific Corporation. Workpiece holder. 4,403,567, Cl. 118-500.000.

Da Cruz Garcia, Nelson. System of vertical filing of articles in sheets and means employed therefor. 4,403,816, Cl. 312-184.000.

Dadant & Sons, Inc.: *See*—
Burgin, Ralph; and Dadant, Timothy C., 4,403,358, Cl. 6-10.000.

Dadant, Timothy C.: *See*—
Burgin, Ralph; and Dadant, Timothy C., 4,403,358, Cl. 6-10.000.

Dahlgrun, Rolf, to Hauni-Werke Korber & Co. KG. Method and apparatus for influencing the permeability of wrappers of filter cigarettes or the like. 4,403,619, Cl. 131-280.000.

Dahlquist, Arthur. Tree planter. 4,403,427, Cl. 37-2.00R.

Dahm, Manfred: *See*—
Jabs, Gert; Dahm, Manfred; Haus, Artur; Nehen, Ulrich; Rath, Klaus; and Weimann, Norbert, 4,404,251, Cl. 428-320.600.

Daicel Chemical Industries, Inc.: *See*—
Watanabe, Shoji; and Nakanishi, Michio, 4,404,333, Cl. 525-437.000.

Daimler-Benz AG: *See*—
Binder, Hellmuth, 4,403,553, Cl. 104-245.000.
Fischer, Dietrich, 4,403,588, Cl. 123-525.000.

Dainippon Ink and Chemicals, Inc.: *See*—
Kitamura, Taku, 4,404,354, Cl. 528-86.000.

Dal Moro, Anacleto: *See*—
Maccone, Sergio; Dal Moro, Anacleto; Pirozzi, Mario; and Capizzi, Amedeo, 4,404,185, Cl. 424-84.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of terminally unsaturated polyimide derivatives with a diaryl conjugated butadiyne. 4,404,139, Cl. 548-423.000.

Daniel, Chelliah, to Air Products and Chemicals, Inc. High conversion of C_3 and C_4 olefins to corresponding unsaturated aldehydes and acids with stable molybdenum catalysts. 4,404,397, Cl. 562-546.000.

Danti, Bernard R. Packaging in extensible bands. 4,403,463, Cl. 53-398.000.

Data General Corporation: *See*—
Stryer, Arthur N., 4,404,530, Cl. 331-1.00A.

Dataproducts Corporation: *See*—
Slagel, Edwin C., 4,404,353, Cl. 528-67.000.

Daudt, William H.; Frye, Cecil L.; and Hyde, James F., to Dow Corning Corporation. Antimicrobial ointment. 4,404,196, Cl. 424-184.000.

Daudt, William H.; Frye, Cecil L.; and Hyde, James F., to Dow Corning Corporation. Blends of water reducible organic materials and aqueous metal ammine siliconate solutions. 4,404,306, Cl. 524-262.000.

David, Agoston: *See*—
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,404,189, Cl. 424-114.000.

Davidson, Maxwell W. Heat transfer elements. 4,403,653, Cl. 165-170.000.

Daviot, Jean, to Novatome. Refractory material intended especially for contacting molten aluminum and process for its manufacture. 4,404,292, Cl. 501-97.000.

Davis, Claude P.: *See*—
Sandor, Joseph; and Davis, Claude P., 4,403,880, Cl. 401-134.000.

Davis, Jack W.; and Blaszuk, Paul R., to United Technologies Corporation. Damage resistant coated laser mirror. 4,403,828, Cl. 350-288.000.

Davis, James P., to Rodew International. Engine fuel consumption reduction system. 4,403,590, Cl. 123-557.000.

Davis, James W.; and Mannherz, Elmer D., to Fischer & Porter Company. Apparatus for injection-molding a liner onto a metal spool. 4,403,933, Cl. 425-129.00R.

Davlin, Irwin H. Flange union with improved recessed seats and sealing ring. 4,403,795, Cl. 285-184.000.

Davy-Loewy, Limited: *See*—
Hope, Thomas, 4,403,492, Cl. 72-201.000.

Dawans, Francois; Devaud, Marguerite; and Nicolas, Denise, to Institut Francais du Petrole. Organometallic polymer compositions useful as constituents of anti-fouling paints for marine structures and their methods of manufacture. 4,404,328, Cl. 525-274.000.

De Vlieg Machine Company Ltd.: *See*—
Peacock, Colin J., [illegible] Cl. 29-568.000.

Dean, Stanley K.; and [illegible]ley, Robert, to Commonwealth of Australia. Forming contours. 4,[illegible]4,507, Cl. 318-570.000.

Dean, Weibley J.; Merriman, David L.; and Ragard, Phillip A., to Universal Instruments Corporation. Sequencer loading head for high speed radial [illegible] component sequencing and inserting machine. 4,403,772, Cl. [illegible]/-76.000.

DeBlanc[illegible]k P., to Pioneer Electric Corporation. Partitioning method and apparatus using data-dependent boundary-marking code wo[illegible]. 4,404,676, Cl. 371-47.000.

Deckman, Harry W.: *See*—
Peiffer, Dennis G.; and Deckman, Harry W., 4,404,255, Cl. 428-406.000.

Dubois, Jean-Claude, to Societe Chimique des Charbonnages-CDF HIMIE. Compositions for the manufacture of hot-melt adhesives. 4,404,299, Cl. 524-77.000.

Jegen, Hugo, to Inpaver AG. Reclining furniture. 4,403,357, Cl. 5-66.000.

de Lauzon, Guillaume; and Mathey, Francois, to Societe Nationale des Poudres et Explosifs. Process for the synthesis of 1,1-diphosphaferrocenes. 4,404,147, Cl. 260-439.0CY.

DeLeo, Richard V., to Rosemount Inc. Flow device for sensors. 4,403,872, Cl. 374-138.000.

Deli, Joseph: *See*—
Zinninger, Thomas C.; and Deli, Joseph, 4,404,016, Cl. 71-78.000.

Del Principe, Robert M.; Hostetler, David A.; and Ling, John, to Mattel, Inc. Electronic game using phototransducer. 4,403,777, Cl. 273-313.000.

DeLuca, Thomas A.: *See*—
Morrison, Robert S.; DeLuca, Thomas A.; and Pasqualone, Ernest, 4,404,057, Cl. 156-324.000.

DeLue, Norman R., to PPG Industries, Inc. Preparation of unsaturated fluorocarbon acids. 4,404,398, Cl. 562-598.000.

Demarne, Henri; and Wagnon, Jean, to C. M. Industries. 3-Indolyl alkylene amino propanols and cardiovascular compositions thereof. 4,404,217, Cl. 424-274.000.

De Matteo, John: *See*—
Stevens, Arthur P.; De Matteo, John; and Beard, Richard M., 4,404,666, Cl. 367-131.000.

Demenus, Richard, to Acoustiquide Corporation. Bidirectional cassette transport. 4,404,611, Cl. 360-137.000.

Dempski, Robert E.; and O'Neill, Joseph L., to Merck & Co., Inc. Methyldopa composition. 4,404,193, Cl. 424-176.000.

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Doyle, Thomas J.: *See*—
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Duke, Horace. Ink and water tester. 4,403,867, Cl. 366-142.000.

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Epstein, Bennett N.; and Pagilagan, Rolando U., 4,404,317, Cl. 524-538.000.
Evans, William L., 4,404,140, Cl. 260-369.000.
Falcoff, Allan F.; Rementer, Stephen W.; and Rodrigues, Allan B. J., 4,403,866, Cl. 366-132.000.
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E & D Specialty Stands, Inc.: *See*—
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E. F. Houghton & Co.: *See*—
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E/M Lubricants, Inc.: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Hill, John A., 4,403,991, Cl. 604-337.000.

Eastern Company, The: *See*—
Clark, Carl A., 4,403,894, Cl. 411-47.000.

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Altland, Henry W.; and Shiao, Daniel D., 4,404,390, Cl. 548-263.000.
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Spielman, Lyle S., 4,403,947, Cl. 431-353.000.

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Edelman, William; and Baranowski, Michael, to Shiley Incorporated. Dual lumen subclavian cannula. 4,403,983, Cl. 604-43.000.

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Edlund, Carl E.; and Sparks, Cecil R., to Southern Gas Association. Piping network analog apparatus. 4,404,646, Cl. 364-803.000.

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Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump. 4,403,583, Cl. 123-387.000.

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Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Fabrication of electrical conductor by replacement of metallic powder in polymer with more noble metal. 4,404,237, Cl. 427-96.000.

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Engle, William R.; Moore, E. Neil, Jr.; Spear, Joseph F., Jr.; and Rockland, Ronald H., to Medtronic, Inc. Implantable cardioverter. 4,403,614, Cl. 128-419.00D.
Engman, Arnold B., to EMCO Industries, Inc. Pipe clamp means. 4,403,378, Cl. 24-277.000.
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Matson, Wayne R., 4,404,065, Cl. 204-1.00T.
Epson Corporation: *See*—
Hosogaya, Hiroshi, 4,403,878, Cl. 400-585.000.
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Ernst, Alfons, to Johannes Heidenhain GmbH. Photoelectric incremental measuring apparatus. 4,403,859, Cl. 356-374.000.
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Evans, William L., to Du Pont de Nemours, E. I., and Company. Manufacture of alkylanthraquinones. 4,404,140, Cl. 260-369.000.
Evertz, Egon. Method of depositing metal coating layers containing particles on the walls of chill moulds. 4,404,232, Cl. 427-8.000.
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Ledbetter, Stephen G.; Singleton, Michael P.; Johns, Thomas J.; and Fabian, James L., 4,403,796, Cl. 285-223.000.
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Facoetti, Hugues; Petit, Patrick; Menoret, Philippe; Micheron, Francois; and Ravinet, Pierre, to Thomson-CSF. Process for manufacturing electromechanical transducers using at least one polymer film. 4,403,382, Cl. 29-25.350.
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Fennell, Robert B. Pilfer proofing system and method for electric utility meter box. 4,404,521, Cl. 324-110.000.
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Gupta, Goutam; and Ramey, Chester E., 4,404,302, Cl. 524-100.000.
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Wolfe, Richard E.; and Fiechtner, Marvin G., 4,403,446, Cl. 47-58.000.
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Baran, Michael S.; Felber, Arthur J.; and Fillus, Gary C., 4,404,445, Cl. 200-314.000.
Finlay, Ross K.: *See*—
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Finney, Michael L.; Moates, Danny; and Brown, Michael R., to Celanese Corporation. Distributor for gel systems to form sharply delineated color patterns upon textile surfaces. 4,403,360, Cl. 8-151.000.
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Cox, Ernest R.; and Snyder, Duane E., Jr., 4,403,533, Cl. 83-56.000.
Fischer, David. Slide-up handle. 4,403,690, Cl. 206-163.000.
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Davis, James W.; and Mannherz, Elmer D., 4,403,933, Cl. 425-129.00R.
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Fisker, Jens E., to Helsingoer Vaerft A/S. Guide blade arrangement for adjustable guide blades. 4,403,913, Cl. 415-150.000.
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Rainbow, Arnold, 4,404,013, Cl. 71-24.000.
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Channing, Christopher P.; and Rovinsky, William Z., 4,404,613, Cl. 361-104.000.
Flaker, Roy C., to International Business Machines Corporation. Programmable integrated circuit and method of testing the circuit before it is programmed. 4,404,635, Cl. 364-481.000.
Fleck, Michael P. Hanger-binder. 4,403,882, Cl. 402-4.000.
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Jourdan, Charles S., 4,404,623, Cl. 363-56.000.
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Floyd, Middleton B., Jr., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-(1'fluorovinyl) prostaglandins and derivatives. 4,404,393, Cl. 560-121.000.
Fock, Jurgen; and Schedlitzki, Dietmar, to Th. Goldschmidt AG. Curable adhesive. 4,404,324, Cl. 525-123.000.
Fodera, Anthony W. Energy saving thermostat. 4,403,646, Cl. 165-11.00R.
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Fohl, Artur, to REPA Feinstanzwerk G.m.b.H. Automatic roll-up device for safety belts. 4,403,752, Cl. 242-107.200.

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Foley, Michael S., to USM Corporation. Component position indicator for electronic component insertion station. 4,403,406, Cl. 29-721.000.

Forberger, Steven C., to RCA Corporation. Method of printing intelligible information. 4,403,547, Cl. 101-170.000.

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Inkpen, Terence; and Newbury, Frank T., 4,404,151, Cl. 261-44.00C.

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Clarke, Theodore R., 4,404,250, Cl. 428-220.000.

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Scherbing, Frank J., 4,403,485, Cl. 70-68.000.

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Foss, George D.: *See*—
Dominguez-Burguette, Mario; and Foss, George D., 4,404,247, Cl. 428-213.000.

Foster, Elton G.: *See*—
Lutz, Eugene F.; and Foster, Elton G., 4,404,406, Cl. 568-571.000.

Fournier, Paul R. Integrated sputtering apparatus and method. 4,404,077, Cl. 204-192.00R.

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Fox, David A., to Westinghouse Electric Corp. Direct current power controller. 4,404,473, Cl. 307-125.000.

Fox Valley Corporation (Breneman Div.): *See*—
Kufrin, Fred W., 4,403,415, Cl. 30-96.000.

Fraas, Lewis M., to Chevron Research Company. Ternary III-V multicolor solar cells and process of fabrication. 4,404,421, Cl. 136-249.000.

Francis, William L. Loose parts plating device. 4,404,078, Cl. 204-202.000.

Franz, Gerhard; and Hund, Franz, to Bayer Aktiengesellschaft. Production of lamellar iron oxide pigments. 4,404,254, Cl. 428-329.000.

Franzen, Paul, to Maschinenfabrik Buckau R. Wolf AG. Method of and apparatus for recovering heat energy contained in vapors of multistage evaporators installed for thermal material-separating processes. 4,403,480, Cl. 62-79.000.

Free, Stephen. Boiler pancake design. 4,403,574, Cl. 122-353.000.

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Freitag, Dieter; Serini, Volker; Goossens, John; Bottenbruch, Ludwig; and Hucks, Uwe, to Bayer Aktiengesellschaft. Separation of diphasic mixtures containing aromatic polyesters. 4,404,363, Cl. 528-486.000.

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Wirth, Hermann O.; and Friedrich, Hans-Helmut, 4,404,408, Cl. 568-680.000.

Fritz, Adolf R., to Robert Bosch GmbH. Engine ignition system with automatic timing shift. 4,403,592, Cl. 123-609.000.

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Weil, Robert A., Jr.; Eck, Gary A.; and Fritz, Gary R., 4,403,536, Cl. 84-1.010.

Froehlich, Harold E., to Minnesota Mining and Manufacturing Company. Medical stapling device. 4,403,693, Cl. 206-339.000.

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Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.

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Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased; and Thomas, Erwin, 4,404,176, Cl. 423-387.000.

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Takano, Toshio, 4,403,683, Cl. 192-0.052.

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Takematsu, Yoshiyuki, 4,404,497, Cl. 315-241.00P.

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Arai, Atsuaki; Oishi, Yasushi; Okumura, Akio; and Nakazyo, Kiyoshi, 4,404,274, Cl. 430-389.000.
Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, 4,404,289, Cl. 436-538.000.
Ohnishi, Masahiro; Ohara, Yuji; Oono, Hiroshi; and Oosaka, Shigenori, 4,404,570, Cl. 346-108.000.
Tabei, Masatoshi, 4,404,586, Cl. 358-44.000.

Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Yoshiki; and Ohmori, Takashi, 4,404,568, Cl. 346-76.0PH.

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Harada, Kuniyoshi; and Fujie, Naofumi, 4,404,632, Cl. 364-425.000.

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Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, 4,404,373, Cl. 544-21.000.

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Fujitsu Limited: *See*—
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Fukuda Metal Foil & Powder Co., Ltd.: *See*—
Tanaka, Kanichi; and Hidaka, Kensuke, 4,404,049, Cl. 148-427.000.

Fukuhara, Shoetsu; Nakamura, Yoshiaki; Ibuki, Tadahiro; and Yamamoto, Masaichi, to Eisai Co., Ltd. Milk-claw including inspection means for milk sucked from cow's teats. 4,403,568, Cl. 119-14.140.

Fukushima, Hiroshi: *See*—
Maeda, Akio; Hashimoto, Kinro; Yagishita, Shigelu; Inagami, Masaaki; and Fukushima, Hiroshi, 4,404,329, Cl. 525-329.200.

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Suzuki, Sousuke, 4,403,953, Cl. 432-122.000.

Furuyama, Tohru; and Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory circuit. 4,404,657, Cl. 365-154.000.

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Jones, David A., 4,404,135, Cl. 260-112.50E.
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Gadzhiev, Yashar A. O.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,403,631, Cl. 138-130.000.

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Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

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Gallelli, Joseph F.: *See*—
Vermess, Michael; Chatterji, Dulal C.; Grimes, George J., Jr.; and Gallelli, Joseph F., 4,404,182, Cl. 424-5.000.

Galli, Mario: *See*—
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Pirotta, Marico G.; and Garbagnati, Giberto, 4,404,346, Cl. 521-29.000.

Gardner, Hugh C., to Union Carbide Corporation. Thermosetting molding compositions. 4,404,319, Cl. 525-39.000.

Gardner, Willis W., to Waukesha Bearings Corporation. Tilting pad thrust bearing. 4,403,873, Cl. 384-306.000.

Garrett Corporation, The: *See*—
Rise, Leif, 4,403,538, Cl. 92-94.000.

Garver, Edward B., Sr., to Baxter Travenol Laboratories, Inc. Support assembly for a cannula and the like. 4,403,990, Cl. 604-273.000.

Garvin, Robert E. Anchor. 4,403,564, Cl. 114-299.000.

Garza, Roberto M. Continuous loop film projecting apparatus. 4,403,746, Cl. 242-55.19R.

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Gebauer, Gerhard; and Bachschmid, Fritz, to J. Wagner GmbH. Method and device for regulating the output of diaphragm pumps. 4,403,926, Cl. 417-388.000.

Gebert, Ulrich; Thorwart, Werner; Komarek, Jaromir; and Cartheuser, Carl, to Hoechst Aktiengesellschaft. O-[3-(4-Substituted-piperazin-1-yl)-2-hydroxypropyl]-hydroxylamines. 4,404,384, Cl. 544-394.000.

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Neidleman, Saul L.; and Geigert, John, 4,404,283, Cl. 435-134.000.

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Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., 4,404,416, Cl. 585-671.000.
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Abolins, Visvaldis; Bopp, Richard C.; Caraher, Joel M.; and Lovgren, Eric M., 4,404,125, Cl. 252-511.000.
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Ballert, Bruce Q., 4,404,358, Cl. 528-158.500.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,404,237, Cl. 427-96.000.
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Iacovangelo, Charles D.; and Zarnoch, Kenneth P., 4,404,267, Cl. 429-41.000.
Johnson, Lloyd H.; Couchman, Robert S.; Spencer, Robert C., Jr.; Booth, John A.; and Holman, Russell J., 4,403,476, Cl. 60-652.000.
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Olson, Daniel R., 4,404,257, Cl. 428-412.000.
Pauze, Denis R., 4,404,331, Cl. 525-424.000.
Rosenberry, George M., 4,403,401, Cl. 29-596.000.
Ryang, Hong-Son, 4,404,350, Cl. 528-26.000.
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Naiff, Kenneth L., 4,404,655, Cl. 365-104.000.
Reichert, Harry J., Jr., 4,404,514, Cl. 324-52.000.

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Caldwell, David L.; and Schelling, Edward C., 4,403,895, Cl. 411-378.000.
Cogswell, James A., II; and Malen, Donald E., 4,403,762, Cl. 248-559.000.
Kleinbohl, Helmut, 4,403,818, Cl. 339-10.000.
Krage, Mark K.; and Meduvsky, Alexander, 4,403,504, Cl. 73-116.000.
Schertz, Burtron D.; and Glandon, Jerry L., 4,404,527, Cl. 330-84.000.
Sherman, James F.; and Vukovich, William J., 4,403,974, Cl. 474-11.000.
Strem, Ervin H., Jr.; and Van Hulle, Gary L., 4,403,805, Cl. 296-221.000.
Young, Robert E.; and Bridgewater, Bobbie D., 4,403,579, Cl. 123-146.50A.

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Janvrin, Robert B., 4,404,534, Cl. 336-197.000.
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Sarno, Nicola, 4,403,955, Cl. 432-158.000.

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Lang, William C., 4,404,364, Cl. 528-502.000.
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Bornstein, Leopold F., 4,404,334, Cl. 525-504.000.

Gerstmann, Joseph; and Vasilakis, Andrew D., to Advanced Mechanical Technology, Inc. Combustion product condensing water heater. 4,403,572, Cl. 122-20.00B.

Gerstner, Dieter, to Licentia Patent-Verwaltungs-GmbH. Indicating device. 4,403,830, Cl. 350-331.00R.

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Muller, Rolf W., 4,404,495, Cl. 315-5.410.

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Hauschopp, Alois; Breuer, Oswald; and Steinkuhl, Bernd, 4,403,809, Cl. 299-34.000.

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Schmeider, Adolf, 4,403,766, Cl. 254-399.000.

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Wallace, William K.; and Giardino, David A., 4,403,532, Cl. 81-483.000.

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Giessen, Bill C.: *See*—
Panchanathan, Viswanathan; Ray, Ranjan; and Giessen, Bill C., 4,404,028, Cl. 75-244.000.

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Knoblauch, Karl; Richter, Ekkehard; Giessler, Klaus; and Korbacher, Werner, 4,404,004, Cl. 55-25.000.

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Trotta, Robert A., 4,403,412, Cl. 30-47.000.
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Gillis, Steven. Process for preparing murine interleukin 2 in the presence of interleukin 1 from an interleukin 2 nonproducer malignant cell line and cell line therefor. 4,404,280, Cl. 435-68.000.

Gillott, George L., to Tri-tech, Inc. Electric rotating machine. 4,404,484, Cl. 310-49.00R.

Gillotti, John A. Grade control alignment device and method. 4,403,889, Cl. 404-72.000.

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Hodes, Erich; and Steeg, Michael, 4,404,263, Cl. 428-564.000.

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Satoh, Hiroaki; Tabata, Yasuyuki; Gomikawa, Kouichi; and Hiruta, Masaru, 4,404,171, Cl. 422-241.000.

Good Thumb Company: *See*—
Valentine, Clark; and Bamber, George E., 4,403,554, Cl. 108-23.000.

Goodin, Richard D.; Chupp, John P.; Balthazor, Terry M.; and Coleman, James P., to Monsanto Company. Electrolytic desulfurization of anilino sulfur compounds. 4,404,069, Cl. 204-59.00R.

Goossens, Carolus C.: *See*—
Buelens, Edward; and Goossens, Carolus C., 4,403,845, Cl. 354-275.000.

Goossens, John: *See*—
Freitag, Dieter; Serini, Volker; Goossens, John; Bottenbruch, Ludwig; and Hucks, Uwe, 4,404,363, Cl. 528-486.000.

Goossens, John C.: *See*—
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,404,321, Cl. 525-68.000.

Gorman, John T., to Lyncross Pty, Ltd. Expanding-sleeve rail fastening. 4,403,734, Cl. 238-372.000.

Gotman, Alexander, to Asta, Ltd. Laser bonding of microelectronic circuits. 4,404,453, Cl. 219-121.0LD.

Goto, Jugo; Mochizuki, Kazutaka; Kubota, Tsutomu; and Miyamoto, Reiji, to Takeda Chemical Industries. Polyurethane composition for powder coating. 4,404,320, Cl. 525-58.000.

Goto, Minari: *See*—
Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, 4,404,030, Cl. 106-2.000.

Gotoh, Tohru, to Mitsubishi Denki Kabushiki Kaisha. Automatic welding apparatus with weld line detecting means. 4,404,455, Cl. 219-124.340.

Gottinger Company, Inc.: *See*—
Gottinger, John G., 4,403,987, Cl. 604-115.000.

Gottinger, John G., to Gottinger Company, Inc. Device for aiding injection of a hypodermic syringe. 4,403,987, Cl. 604-115.000.

Gould, William S.: *See*—
Livia, Michael R.; Gould, William S.; and Suhr, Peter J., 4,403,688, Cl. 198-785.000.

Gourse, Jerome A., to Velsicol Chemical Corporation. Herbicidal α-cyanobenzyl 3,6-dichloro-2-methoxy-benzoate. 4,404,021, Cl. 71-105.000.

Goutard, Rene-Michel; and Piry, Pierre, to Automatisme et Technique; and Laboratoires Sophartex. Device for sealing hard gelatin capsules and for packing a liquid product dose in the thus sealed capsule. 4,403,461, Cl. 53-282.000.

Graf, Norman G.: *See*—
Ford, Alan T.; and Graf, Norman G., 4,403,423, Cl. 33-432.000.

Grafen, Karl, to H. Krantz GmbH & Co. Chain for a tenter frame with tentering clamping and needle combination links. 4,403,379, Cl. 26-95.000.

Grande, Johannes; and Brown, James H., to Rockwell International Corporation. Detecting redundant digital codewords using a variable criterion. 4,404,677, Cl. 371-69.000.

Grangette, Henri: *See*—
Tellier, Jacques; Chambu, Claude; Coste, Jean-Francois; and Grangette, Henri, 4,404,109, Cl. 252-8.55D.

Grant, Frederic F., to Bell & Howell Company. Bidirectional tape advancing method and apparatus. 4,403,720, Cl. 226-190.000.

Graves, J. Robert, to Mead Corporation, The. Surface profile recorder. 4,403,419, Cl. 33-174.00P.

Gray, Robert C. Roller skate axle suspension. 4,403,784, Cl. 280-11.280.

Green, Harvey E., Jr.: *See*—
Dickson, Jerald L.; and Green, Harvey E., Jr., 4,404,054, Cl. 156-92.000.

Green, Martin A.; and Blakers, Andrew W., to Unisearch Limited. High efficiency solar cell structure. 4,404,422, Cl. 136-255.000.

Greenwell, Jack, to LearAvia. Motor drive circuit. 4,404,512, Cl. 318-807.000.

Greenwood, Arthur R., to UOP Inc. Method for discharging catalyst particles from a moving bed system at a substantially steady flow rate. 4,403,909, Cl. 414-786.000.

Gregorian, Roubik: *See*—
Amir, Gideon; Haque, Yusuf; and Gregorian, Roubik, 4,404,525, Cl. 330-9.000.

Grieder, Alfred: *See*—
Fah, Hansjakob; and Grieder, Alfred, 4,404,388, Cl. 546-345.000.

Grieve, Harold R.; and Andersen, Thomas S., to General Foods Corporation. Multi-compartmented display carton. 4,403,727, Cl. 229-27.000.

Griffis, Patrick D., to RCA Corporation. Matching volume control characteristics for two channels. 4,404,429, Cl. 179-1.0VL.

Griffith-Hope Company: *See*—
Cornell, Robert W., 4,403,748, Cl. 242-55.530.

Grimes, George J., Jr.: *See*—
Vermess, Michael; Chatterji, Dulal C.; Grimes, George J., Jr.; and Gallelli, Joseph F., 4,404,182, Cl. 424-5.000.

Groff, Gaylord L.: *See*—
Charbonneau, Robert R.; and Groff, Gaylord L., 4,404,246, Cl. 428-212.000.

Groke, Ulrich, to Julich Gesellschaft mit beschrankter Haftung. Heat-pipe with residual gas collector vessel. 4,403,651, Cl. 165-104.270.

Grosjean, Jean-Claude; and Landry, Jean-Marie, to Institut de Recherches de la Siderurgie Francaise (IRSID). Bottom of metallurgical container and process of forming the same. 4,403,768, Cl. 266-44.000.

Groskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased (by Rapp, Ruth E., legal representative); and Thomas, Erwin, to BASF Aktiengesellschaft. Preparation of hydroxylammonium salts. 4,404,176, Cl. 423-387.000.

Grow, Robert M., to Burroughs Corporation. Timed token ring with multiple priorities. 4,404,557, Cl. 340-825.050.

Grudowski, Raymond A., to Allen-Bradley Company. Programmable controller for using coded I/O data technique. 4,404,651, Cl. 364-900.000.

Grunewalder, John F., to PPG Industries, Inc. Treatment of wood with water repellent compositions. 4,404,239, Cl. 427-393.000.

GTE Automatic Electric Incorporated: *See*—
Karchevski, Robert A., 4,404,675, Cl. 371-47.000.

GTE Automatic Electric Labs Inc.: *See*—
Koppensteiner, James V.; and Onesto, Joseph B., 4,403,408, Cl. 29-764.000.

GTE Laboratories Incorporated: *See*—
Stein, Richard J., 4,403,396, Cl. 29-571.000.

GTE Products Corporation: *See*—
Shaffer, John W., 4,403,973, Cl. 445-28.000.

Guazzone, Bruno: *See*—
Muller, Hans; and Guazzone, Bruno, 4,404,106, Cl. 210-772.000.

Guerci, James N.: *See*—
Gurney, John W.; Guerci, James N.; and Allison, Clifford, Jr., 4,404,565, Cl. 343-881.000.

Guerreau, Rene: *See*—
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, 4,403,788, Cl. 280-605.000.

Gugenberger, Thorolf, to Varta Batterie Aktiengesellschaft. Corrosion protection for non-amalgamated zinc. 4,404,117, Cl. 252-182.100.

Guillory, Jack P.: *See*—
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., 4,404,087, Cl. 208-48.0AA.

Gulf Oil Corporation: *See*—
Rutter, Jerry L., 4,404,017, Cl. 71-88.000.

Gulf Research & Development Company: *See*—
Schulz, Johann G. D.; and Cobler, John A., 4,403,998, Cl. 44-51.000.

Gulla, Michael: *See*—
Taylor, Paul; and Gulla, Michael, 4,404,357, Cl. 528-153.000.

Gundel, Janos: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,404,204, Cl. 424-250.000.

Gunther, Wilhelm: *See*—
Ernst, Dieter; Forster, Hilmar; Gunther, Wilhelm; and Vahldiek, Ernst, 4,403,705, Cl. 213-1.300.

Gupta, Goutam; and Ramey, Chester E., to Ferro Corporation. Acylated hindered hexahydropyrimidines and their use as light stabilizing agents. 4,404,302, Cl. 524-100.000.

Gur, Turgut M.: *See*—
Huggins, Robert A.; and Gur, Turgut M., 4,404,068, Cl. 204-59.00R.

Gurney, Anthony R., to Donovan Wire & Iron Co. Headlamp door lever assembly. 4,403,524, Cl. 74-538.000.

Gurney, John I. Method and apparatus for fabricating dental prosthetics. 4,403,961, Cl. 433-213.000.

Gurney, John W.; Guerci, James N.; and Allison, Clifford, Jr., to Radiation Systems Incorporated. Quickly erectable antenna support structure. 4,404,565, Cl. 343-881.000.

Gutek, Beth I., to Dow Corning Corporation. Flame retardant polyorganosiloxane resin compositions. 4,404,305, Cl. 524-118.000.

Gutsche, Gunter E. Method and apparatus for use in harnessing solar energy to provide initial acceleration and propulsion of devices. 4,403,755, Cl. 244-53.00R.

Gyurics, Karoly: *See*—
Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,403,803, Cl. 296-179.000.

H. Krantz GmbH & Co.: *See*—
Grafen, Karl, 4,403,379, Cl. 26-95.000.

Hacker, Marlin W.: *See*—
Mountz, Elton; Whiteman, Paul; Higginson, Roy C.; and Hacker, Marlin W., 4,403,804, Cl. 296-183.000.

Hackman, Donald J.: *See*—
Caudy, Don W.; Hackman, Donald J.; Hoffman, Robert T.; and Uhler, Dale G., 4,404,170, Cl. 422-237.000.

Haddad, James H.; and Krambeck, Frederick J., to Mobil Oil Corporation. Method and means for separating gaseous materials from finely divided catalyst particles. 4,404,095, Cl. 208-161.000.

Haeck, Paul J., to Wallace Murray Corporation. Fluid shear coupling apparatus. 4,403,684, Cl. 192-58.00B.

Haeusler, Roland. Novel mortise-and-tenon type joint for furniture. 4,403,886, Cl. 403-217.000.

Hagiwara, Sumio: *See*—
Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozeki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.

Hahn & Clay: *See*—
Pechacek, Raymond E., 4,403,387, Cl. 29-416.000.

Haigh, Richard B.: *See*—
Sitek, George J.; and Haigh, Richard B., 4,404,461, Cl. 219-490.000.

Hajek, Manfred; Wagner, Kuno; Uerdingen, Walter; and Wellner, Wolfgang, to Bayer Aktiengesellschaft. Cycloaminals and a process for their preparation. 4,404,379, Cl. 544-231.000.

Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 4,403,858, Cl. 356-237.000.

Halbach and Braun: *See*—
Braun, Gert; and Braun, Ernst, 4,403,808, Cl. 299-34.000.

Halbich, Frank. Plastic pill box and associated loading appliance. 4,403,462, Cl. 53-392.000.

Halcon SD Group, Inc., The: *See*—
Kochar, Nand K.; and Ozero, Brian J., 4,404,399, Cl. 564-402.000.

Halliburton Company: *See*—
Bridges, James R., 4,404,163, Cl. 376-119.000.

Hallmark Cards, Inc.: *See*—
Raymoure, Russell A.; Bechtel, Richard P., Jr.; Carson, Ray; and Don Carlos, Alva G., 4,403,695, Cl. 206-497.000.

Hambrecht, Juergen: *See*—
Naarmann, Herbert; Hambrecht, Juergen; and Rieber, Norbert, 4,404,359, Cl. 528-216.000.

Hamlin, Humphrey A. S.; and Taylor, James C., to Normalair-Garrett (Holdings) Limited. Molecular sieve type gas separation systems. 4,404,005, Cl. 55-163.000.

Hamoen, Dirk W.: *See*—
deWalle, Stewart; Hamoen, Dirk W.; and Boyd, James W., 4,403,510, Cl. 73-644.000.

Hancock, Homer H. Water-hose-powered garden/agricultural sprayers and special nozzle. 4,403,737, Cl. 239-154.000.

Hann, Paul D.: *See*—
Hutson, Thomas, Jr.; and Hann, Paul D., 4,404,418, Cl. 585-710.000.

Hanna, Marie R.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,404,307, Cl. 524-290.000.

Hannan, William J., to Itek Corporation. Imaging system with enlarged depth of field. 4,404,594, Cl. 358-209.000.

Hannon, Betty R.: *See*—
Dolak, Lester A.; Reusser, Fritz; Castle, Thomas M.; Hannon, Betty R.; Laborde, Alice L.; and Marschke, Charles K., 4,404,190, Cl. 424-118.000.
Hansen, Robert: *See*—
Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., 4,404,416, Cl. 585-671.000.
Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., 4,404,417, Cl. 585-671.000.
Hansen, Robert S. Holding device for pencils and the like. 4,403,699, Cl. 211-69.100.
Hanson, Douglas R. Brush assembly for cleaning bread pans. 4,403,365, Cl. 15-56.000.
Haque, Yusuf: *See*—
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Hara, Sumio: *See*—
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Harada, Hiroshi: *See*—
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Harada, Kuniyoshi; and Fujie, Naofumi, to Aisin Seiki Kabushiki Kaisha. Attitude control system for driver's seat. 4,404,632, Cl. 364-425.000.
Harada, Nobuo: *See*—
Miyano, Tetsuji; Suzuki, Kunio; and Harada, Nobuo, 4,404,378, Cl. 544-131.000.
Harada, Nozomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state image sensor with lag control electrode. 4,404,466, Cl. 250-211.00J.
Harden, Jimmie K.: *See*—
Ishibe, Nobuyuki; and Harden, Jimmie K., 4,404,412, Cl. 570-109.000.
Hardin, Lewis T.: *See*—
McCormick, Joseph A.; and Hardin, Lewis T., 4,403,793, Cl. 283-105.000.
Haringer, Alois, to VEMA, S.p.A. Articulated arm for excavator machines. 4,403,429, Cl. 37-103.000.
Harke, Hans-Peter: *See*—
Sporkenbach, Jutta; Eggensperger, Heinz; Bucklers, Lothar; Ehlers, Helmut H.; Eigener, Ulrich; and Harke, Hans-Peter, 4,404,191, Cl. 424-130.000.
Harper, Orville R. Paint can support for ladders. 4,403,368, Cl. 15-257.00R.
Harrington, Edward L.: *See*—
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Harris Corporation: *See*—
Ports, Kenneth A., 4,404,658, Cl. 365-154.000.
Taylor, David L., 4,403,399, Cl. 29-574.000.
Harris, Denis L, to Norton Company. Microwave heating process for grinding wheels. 4,404,003, Cl. 51-298.000.
Harris, Eugene G., to Emery Industries, Inc. Process for enhancing the fragrance qualities of ethylene glycol monoaryl ethers. 4,404,407, Cl. 568-648.000.
Harris, Robert D.: *See*—
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Harsco Corporation: *See*—
Henderson, Frank E., 4,403,783, Cl. 280-5.00G.
Hartmann, Werner, to Harwe AG. Homogeneous molded article produced from polylactam by activated anionic polymerization of medium lactams. 4,404,360, Cl. 528-326.000.
Harton, Donald L., to Bendix Corporation, The. Housing and mounting assembly providing a temperature stabilized environment for a microcircuit. 4,404,459, Cl. 219-209.000.
Hartwig, Jurgen, to Pfaff Hauschaltmaschinen GmbH. Device for controlling the drive of a stepping motor, to adjust the lateral stitch bight and/or the feed length of a sewing machine. 4,404,509, Cl. 318-685.000.
Hartwig, Volker: *See*—
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Haruta, Yasuhiko: *See*—
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Harvey Hubbell Incorporated: *See*—
Hughes, Ronald W.; and Srnka, Leonard J., 4,404,612, Cl. 361-31.000.
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Harwood, Leopold A.: *See*—
Shanley, Robert L., II; and Harwood, Leopold A., 4,404,593, Cl. 358-168.000.
Hasco-Normalien Hasenclever & Co.: *See*—
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Hashimoto, Kinro: *See*—
Maeda, Akio; Hashimoto, Kinro; Yagishita, Shigelu; Inagami, Masaaki; and Fukushima, Hiroshi, 4,404,329, Cl. 525-329.200.
Hashimoto, Shunichi: *See*—
Uematsu, Tamon; Hashimoto, Shunichi; and Matsumoto, Hiroshi, 4,404,019, Cl. 71-92.000.
Haskell, Theodore H.; and Hutt, Marland P., to Warner-Lambert Company. Cephalosporins. 4,404,201, Cl. 424-246.000.
Haskell, Weston W., to Shell Oil Company. Method for the prevention or inhibition of popcorn polymer in organic material containing vinyl compounds. 4,404,473, Cl. 585-2.000.
Hata, Akio; and Tanga, Michifumi, to Tokuyama Sekisui Kogyo Kabushiki Kaisha. Process for inhibiting the formation of scale in the suspension polymerization of vinyl chloride. 4,404,337, Cl. 526-62.000.
Hata, Ikuro; and Takeda, Masashi, to Sony Corporation. Digital-to-analog converter. 4,404,546, Cl. 340-347.0DA.
Hatakeyama, Narito, to Kabushiki Kaisha Yoshida Seisakusho. Coupling device for a dental instrument. 4,403,959, Cl. 433-126.000.
Hatakeyama, Yoshiharu: *See*—
Ogasawara, Hirotake; Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,403,932, Cl. 425-85.000.
Hattori, Tadashi; Yamaguchi, Hiroaki; and Ozaki, Tadashi, to Nippon Soken, Inc. Ignition range detector for internal combustion engine. 4,403,505, Cl. 73-117.300.
Hattori, Tetuo: *See*—
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Hattori, Yoshiyuki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunaku, 4,403,910, Cl. 415-53.00T.
Hauni-Werke Korber & Co. KG: *See*—
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Joseph, Horst D.; and Koch, Friedo, 4,403,620, Cl. 131-280.000.
Hauri, Robert; and Reinhard, Peter. Extracoronal holding member for dental prostheses. 4,403,960, Cl. 433-177.000.
Haus, Artur: *See*—
Jabs, Gert; Dahm, Manfred; Haus, Artur; Nehen, Ulrich; Rath, Klaus; and Weimann, Norbert, 4,404,251, Cl. 428-320.600.
Hauschopp, Alois; Breuer, Oswald; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Mineral winning plough. 4,403,809, Cl. 299-34.000.
Hawkins, William R., to Texas Instruments Incorporated. Electronic teaching apparatus. 4,403,965, Cl. 434-327.000.
Hayase, Tamiki: *See*—
Nakamura, Toshiomi; Okamura, Masakazu; Moriguchi, Yoichiro; and Hayase, Tamiki, 4,404,347, Cl. 527-300.000.
Hayashi, Makoto; and Shimizu, Tasuku, to Hitachi, Ltd. Method for foreseeing residual life of structural member making use of X-ray. 4,404,682, Cl. 378-72.000.
Hayes, John C.: *See*—
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Haynes, Andrew, to Baker International Corporation. Torque transmitting expansion joint and a hanger assembly incorporating same. 4,403,654, Cl. 166-73.000.
Hazelett, David A.; Shaw, Charles B.; and McCombs, Paul W., to Astral Industries, Inc. Casket bed. 4,403,380, Cl. 27-12.000.
Hebert, Raymond T. Method and apparatus for room temperature stabilization. 4,403,644, Cl. 165-1.000.
Heesen, Theodorus J. Press for compressing a powdery material. 4,403,936, Cl. 425-331.000.
Heider, Manfred; Hofschneider, Josef; Schallenberger, Wolfgang; Nodes, Franz; and Kempe, Eberhard, to Vogelbusch Gesellschaft m.b.H. Measurement of volatile constituents of a culture medium. 4,404,284, Cl. 435-291.000.
Heidrich, Gunther; and Stolzle, Karl, to BHS-Bayerische Berg-, Hutten-und Salzwerke. Marine transmission gear unit with double drive. 4,403,968, Cl. 440-3.000.
Heimburger, Norbert: *See*—
Becker, Udo; Braun, Konrad; and Heimburger, Norbert, 4,404,134, Cl. 260-112.50R.
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Preis, Hans M., 4,404,187, Cl. 424-101.000.
Heise, Klaus-Peter; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 4-nitrodiphenylamines. 4,404,400, Cl. 564-406.000.
Helsingoer Vaerft A/S: *See*—
Fisker, Jens E., 4,403,913, Cl. 415-150.000.
Henderson, Frank E., to Harsco Corporation. Liquid and granular hauling trailer. 4,403,783, Cl. 280-5.00G.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Osberghaus, Rainer; Ellwanger, Hans; Marsen, Horst; and Bossek, Harald, 4,404,039, Cl. 134-3.000.
Herbert Kannegiesser GmbH & Co.: *See*—
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Herbstman, Sheldon: *See*—
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Hercules Incorporated: *See*—
Bloothoofd, William, 4,403,566, Cl. 118-407.000.
Jabloner, Harold, 4,404,314, Cl. 524-519.000.
Maslanka, William W.; and Spence, Gavin G., 4,404,310, Cl. 524-457.000.
Herlin, Patrick: *See*—
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Herman, Morton B.: *See*—
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Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,404,101, Cl. 210-232.000.
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Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,404,205, Cl. 424-251.000.
Herr, John A., to Singer Company, The. Brush board assembly for dynamoelectric machine. 4,404,488, Cl. 310-239.000.

Herriau, Paul, to Societe SOGEFINA Societe de Gestion Financiere Armoricaine. Distributing device for so-called single-seed seed drills and seed drill comprising such a device. 4,403,713, Cl. 221-265.000.
Herschel, Ben B.; and Chaloka, Andrew, to Wing Industries, Inc. Omni-directional face-and-bypass coil. 4,403,649, Cl. 165-101.000.
Herskovits, Lily E., to UOP Inc. Regeneration of adsorbents by low temperature hydrogen stripping. 4,404,118, Cl. 252-411.00R.
Hesky, Hans; and Wunderer, Armin, to Hoechst Aktiengesellschaft. Process for carrying away the decay heat of radioactive substances. 4,404,165, Cl. 376-272.000.
Hess, Hans-Jurgen E.: *See*—
Johnson, Michael R.; Schaaf, Thomas K.; and Hess, Hans-Jurgen E., 4,404,372, Cl. 542-429.000.
Hess, John L. Pipe thread cleaner. 4,403,363, Cl. 15-104.040.
Hessler, Edward J.: *See*—
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Hetzler, Bernard H.; and Martin, Hugh V., to MacMillan Bloedel Limited. Surface stabilized waferboard. 4,404,252, Cl. 428-326.000.
Hewlett-Packard Company: *See*—
Larson, John D., III; and Miller, David G., 4,404,489, Cl. 310-334.000.
Heyl, Tilo: *See*—
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Heynisch, Hinrich, to Siemens Aktiengesellschaft. Travelling wave tube with periodic-permanent magnet focusing system. 4,404,494, Cl. 315-3.500.
Hiatt, Norman A.: *See*—
Margerum, Edward S.; and Hiatt, Norman A., 4,404,249, Cl. 428-216.000.
Hicinbothem, Walter A., Jr.: *See*—
Tarng, Ming L.; and Hicinbothem, Walter A., Jr., 4,404,235, Cl. 427-89.000.
Hickey, Robert J. Ski to boot attachment mechanism. 4,403,789, Cl. 280-614.000.
Hicks, Chester F. Cathodic corrosion resistant pipe saddle with low friction insert. 4,403,759, Cl. 248-55.000.
Hidaka, Kensuke: *See*—
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Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, 4,404,352, Cl. 528-45.000.
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Westcott, Douglas W., 4,404,519, Cl. 324-73.00R.

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Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., 4,404,577, Cl. 357-23.000.
Flaker, Roy C., 4,404,635, Cl. 364-481.000.
Holmes, Richard D., 4,404,652, Cl. 365-8.000.
Jones, Darryl S.; Larkin, Donald W.; Toner, Michael F.; and Werve, Carleton E., 4,404,647, Cl. 364-900.000.
Jones, Robert E., Jr., 4,404,609, Cl. 360-126.000.
Masenas, Charles J., Jr., 4,404,662, Cl. 365-203.000.
Shepard, Joseph F.; and Tsang, Paul J., 4,403,394, Cl. 29-571.000.
Williams, Errol R., Jr., 4,404,560, Cl. 340-870.370.

International Computers Limited: *See*—
Robinson, John E., 4,403,410, Cl. 29-830.000.

International Flavors & Fragrances Inc.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,404,307, Cl. 524-290.000.
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,404,184, Cl. 424-49.000.

International Harvester Co.: *See*—
Sammarco, Peter, 4,403,670, Cl. 180-14.00R.
Watmough, Thomas, 4,404,262, Cl. 428-539.500.

International Paper Company: *See*—
Cael, John J., 4,404,061, Cl. 162-76.000.

International Standard Electric Corporation: *See*—
Bricheno, Terry; Robertson, Alexander J.; and Finlay, Ross K., 4,404,010, Cl. 65-4.200.

Internationale Octrooi Maatschappij "Octropa" B.V.: *See*—
Cloosterman, Aloysius B. M.; and Kranenburg, Simon V., 4,404,228, Cl. 426-98.000.

Interox Chemicals Limited: *See*—
Hignett, Geoffrey J., 4,403,994, Cl. 8-111.000.

Interpower A/S: *See*—
Thomte, Magnus, 4,403,517, Cl. 73-863.840.

IRI, Inc.: *See*—
Wright, W. Andrew, Jr., 4,404,589, Cl. 358-86.000.

Irie, Hiroyuki: *See*—
Nonomura, Kinzo; Watanabe, Masanori; Takesako, Yoshinobu; Irie, Hiroyuki; and Ide, Susumu, 4,404,493, Cl. 313-422.000.

Isett, Don D.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,403,558, Cl. 112-121.110.

Ishibe, Nobuyuki; and Harden, Jimmie K., to Dow Chemical Company, The. Trichloroethylene composition stabilized against oxidation. 4,404,412, Cl. 570-109.000.

Ishida, Toshihiko, to TDK Electronics Co., Ltd. Protective sheet for cassette holding magnetic recording tape. 4,404,245, Cl. 428-206.000.

Ishida, Yukihiko: *See*—
Kawagishi, Yoji; Ishida, Yukihiko; and Ishikawa, Kazuhiro, 4,404,271, Cl. 430-110.000.

Ishiguro, Mitsuo: *See*—
Ogasawara, Hirotake; Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,403,932, Cl. 425-85.000.

Ishii, Kinichi, to Kabushiki Kaisha Johnan Seisakusho. Window regulator for an automotive vehicle. 4,403,450, Cl. 49-352.000.

Ishii, Takeshi: *See*—
Mizuno, Junzi; Fukami, Akira; Noguchi, Hiroki; and Ishii, Takeshi, 4,403,587, Cl. 123-519.000.

Ishikawa, Kazuhiro: *See*—
Kawagishi, Yoji; Ishida, Yukihiko; and Ishikawa, Kazuhiro, 4,404,271, Cl. 430-110.000.

Ishizaki, Kanjiro: *See*—
Sudoh, Giichi; Minegishi, Keiichi; Ishizaki, Kanjiro; and Uchida, Ikuo, 4,404,031, Cl. 106-90.000.

Ishizuka, Hiroshi. Vacuum separator. 4,403,769, Cl. 266-149.000.

Isii, Kaniti: *See*—
Tomite, Tosio; Ogasawara, Nobuhiko; Isii, Kaniti; and Kanamaru, Hisanobu, 4,403,402, Cl. 29-598.000.

Isobe, Yukihiro: *See*—
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, 4,404,259, Cl. 428-425.900.

Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, to Mitsubishi Gas Chemical Company, Inc. Process for producing adipic acid diester. 4,404,394, Cl. 560-204.000.

Itai, Humio, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic reproducing apparatus. 4,404,607, Cl. 360-105.000.

Itek Corporation: *See*—
Hannan, William J., 4,404,594, Cl. 358-209.000.

Ito, Makoto: *See*—
Kitamura, Yoichi; Hotta, Hisashi; Yurita, Chikara; and Ito, Makoto, 4,404,447, Cl. 219-64.000.

Ito, Senji: *See*—
Hirota, Kazumi; Tsutsumi, Yotaro; Ito, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; and Hori, Ichiro, 4,403,710, Cl. 220-270.000.

Ito, Tatsuo; Shomura, Takashi; Kojima, Michio; Ezaki, Norio; Sezaki, Masaji; and Niwa, Tomizo, to Meiji Seika Kaisha Ltd. Antibiotic SF-2103A substance and process for production thereof. 4,404,218, Cl. 424-274.000.

IVAC Corporation: *See*—
Busche, William W., 4,404,440, Cl. 200-83.00R.

Ives, Jeffrey L., to Pfizer Inc. Phenylguanidine therapeutic agents. 4,404,219, Cl. 424-274.000.

Iwai, Tomio; and Tobinaga, Motoi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Separate lubricating system for outboard engine. 4,403,578, Cl. 123-73.0AD.

Iwamatsu, Seiichi: *See*—
Komatsu, Shoichi; and Iwamatsu, Seiichi, 4,404,236, Cl. 427-94.000.

Iwamoto, Kenzo: *See*—
Kakehi, Masanori; Higashida, Yoshitaka; Iwamoto, Kenzo; and Kano, Hikaru, 4,404,056, Cl. 156-244.110.

Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of 7α-methoxy-7β-(1,3-diethietane-2-carboxamido)cephalosporanic acid derivatives. 4,404,373, Cl. 544-21.000.

Iwasaki, Hiroshi: *See*—
Ojima, Shin; Watanabe, Kazutaka; and Iwasaki, Hiroshi, 4,404,643, Cl. 364-705.000.

Iwasaki, Norio: *See*—
Kobayashi, Shigeki; Iwasaki, Norio; Ikeda, Yasunori; Miyake, Tamio; and Tanimura, Shigeru, 4,404,683, Cl. 382-6.000.

Iwasaki, Shinichiro, to Aisin Seiki Company, Limited. Position sensor. 4,403,515, Cl. 73-862.380.

Iwaya, Shoichi; Masumura, Hitoshi; Midori, Yoshifumi; Oikawa, Yasunobu; and Abe, Hisao, to TDK Electronics Co., Ltd. Non-linear polycrystalline barium titanate-type dielectric element. 4,404,029, Cl. 501-139.000.

J. H. Fenner & Co. Ltd.: *See*—
Potter, Charles W., 4,403,780, Cl. 277-88.000.

J. I. Case Company: *See*—
Maurer, Herman J.; and Pedersen, Carl O., 4,403,905, Cl. 414-695.500.

J. Wagner GmbH: *See*—
Gebauer, Gerhard; and Bachschmid, Fritz, 4,403,924, Cl. 417-388.000.

Jabloner, Harold, to Hercules Incorporated. Preparation of stable aqueous dispersions of polyolefin fibers. 4,404,314, Cl. 524-519.000.

Jabs, Gert; Dahm, Manfred; Haus, Artur; Neben, Ulrich; Rath, Klaus; and Weimann, Norbert, to Bayer Aktiengesellschaft. Copying systems, a process for their production, and suitable printing inks for both offset and book printing. 4,404,251, Cl. 428-320.600.

Jackson Laboratory, The: *See*—
Mayer, Ben; and Phillips, Catherine A., 4,404,590, Cl. 358-106.000.

Jackstone Froster Limited: *See*—
Fenner, Frank R., 4,403,482, Cl. 62-341.000.

Jahani, Hooshang, to National Semiconductor Corporation. Plating mask support. 4,404,079, Cl. 204-224.00R.

Jahani, Hooshang, to National Semiconductor Corporation. Molded plating mask. 4,404,080, Cl. 204-224.00R.

Jamar, Walker. Apparatus for wall mounted presentation boards. 4,403,761, Cl. 248-441.00B.

James Hardie & Coy. Pty. Limited: *See*—
Seach, Barry G.; Muller, Hans; and Cohen, Solomon E., 4,403,938, Cl. 425-393.000.

James River-Dixie/Northern, Inc.: *See*—
Mueller, Robert L.; and Cherney, Jerome A., 4,404,241, Cl. 428-35.000.

Jan, Gerald: *See*—
Forte, Eddy; Fryberg, Mario; and Jan, Gerald, 4,404,273, Cl. 430-377.000.

Jankovsky, Frantisek; and Lincke, Paul, to Sulzer Brothers Limited. Weft yarn storage device for weaving machines. 4,403,634, Cl. 139-452.000.

Janome Sewing Machine Co., Ltd.: *See*—
Makabe, Hachiro; Orii, Akira; and Takahashi, Yoshitaka, 4,403,560, Cl. 112-158.00E.

Janssen, Edward W., to Minnesota Mining and Manufacturing Company. Novel adhesive compositions. 4,404,345, Cl. 526-206.000.

Janssen, Harvey W., to Wolff Manufacturing Company. Power-operated torque wrench. 4,403,663, Cl. 173-12.000.

Janvrin, Robert B., to General Signal Corporation. Electromagnetic assembly. 4,404,534, Cl. 336-197.000.

Jaulmes, Christian, to Ateliers de la Motobecane S.A. Dual linkage coupling mechanism for a moped for engaging a motor driven pulley with the moped rear wheel. 4,403,672, Cl. 180-205.000.

Jenkins, Robert D., to Reilich, David G.; Unipak, Inc.; and Quinn, Jeffrey J., part interest to each. Picture frame assembly. 4,403,434, Cl. 40-152.000.

Jennie, Fred, to Weatherby, Inc. Trigger mechanism for multiple barrel firearm providing barrel selection. 4,403,436, Cl. 42-42.00R.

Jenoptik Jena G.m.b.H.: *See*—
Meier, Ludwig, 4,403,964, Cl. 434-286.000.

Jensen, Borge: *See*—
Rasmussen, Ole-Bendt; and Jensen, Borge, 4,403,934, Cl. 425-192.00R.

Johannes Heidenhain GmbH: *See*—
Ernst, Alfons, 4,403,859, Cl. 356-374.000.

Johanson, Edwin S.: *See*—
Huibers, Derk T. A.; and Johanson, Edwin S., 4,404,084, Cl. 208-10.000.

Johns, Thomas J.: *See*—
Ledbetter, Stephen G.; Singleton, Michael P.; Johns, Thomas J.; and Fabian, James L., 4,403,796, Cl. 285-223.000.

Johnson, Jay M., to Yellow Springs Instrument Company, The. Method for quantitatively determining a particular substrate catalyzed by a multisubstrate enzyme. 4,404,066, Cl. 204-1.00T.

Johnson, Lloyd H.; Couchman, Robert S.; Spencer, Robert C., Jr.; Booth, John A.; and Holman, Russell J., to General Electric Company. Method for operating a steam turbine with an overload valve. 4,403,476, Cl. 60-652.000.

Johnson, Marvin M.; Walker, Darrell W.; and Nowack, Gerhard P., to Phillips Petroleum Company. Selective hydrogenation catalyst. 4,404,124, Cl. 252-466.0PT.

Johnson, Michael R.; Schaaf, Thomas K.; and Hess, Hans-Jurgen E., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandin derivatives. 4,404,372, Cl. 542-429.000.

Johnson, Paul H.; and Benjamin, Harwell E., to Phillips Petroleum Company. Apparatus and method for producing carbon black. 4,404,178, Cl. 423-450.000.

Johnson, Robert E.: *See*—
Pekari, Frederick J.; and Johnson, Robert E., 4,403,912, Cl. 415-150.000.

Johnson, Victor R., Jr. System for detecting leaks from liquid-containing reservoirs and conduits. 4,404,516, Cl. 324-54.000.

Jolly, Walter R.: *See*—
Krishnamumar, Suppayan M.; and Jolly, Walter R., 4,403,940, Cl. 425-529.000.

Jones, Charles, to Curtiss-Wright Corporation. Multi-unit rotary mechanism. 4,403,928, Cl. 418-60.000.

Jones, Darryl S.; Larkin, Donald W.; Toner, Michael F.; and Werve, Carleton E., to International Business Machines Corp. Dynamic array error recovery. 4,404,647, Cl. 364-900.000.

Jones, David A., to G. D. Searle & Co. Enkephalin derivatives. 4,404,135, Cl. 260-112.50E.

Jones, John E.; and Castelli, Vittorio R., to Xerox Corporation. Snubbed anchoring apparatus. 4,403,877, Cl. 400-335.000.

Jones, Michael C.: *See*—
Glamkowski, Edward J.; and Jones, Michael C., 4,404,221, Cl. 424-285.000.

Jones, Robert E., Jr., to International Business Machines Corporation. Thin film inductive transducer for perpendicular recording. 4,404,609, Cl. 360-126.000.

Jones, Russell P. Trailer unit. 4,403,802, Cl. 296-25.000.

Josef, Michael J.: *See*—
Romanski, Eric R.; and Josef, Michael J., 4,403,632, Cl. 139-383.00A.

Joseph, Horst D.; and Koch, Friedo, to Hauni-Werke Korber & Co. KG. Method and apparatus for monitoring the functioning of testing devices in machines for the production and/or processing of smokers' products. 4,403,620, Cl. 131-280.000.

Jourdan, Charles S., to Florida Computer Graphics. Method and apparatus for balancing flux in a power transformer circuit. 4,404,623, Cl. 363-56.000.

Jozuka, Masao: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; Jozuka, Masao; and Sakaida, Atsuo, 4,403,875, Cl. 400-124.000.

Juergensen, Heinrich; and Zelenka, Thomas, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for the correction of the position error of a multifaceted rotating mirror. 4,404,596, Cl. 358-293.000.

Julich Gesellschaft mit beschrankter Haftung: *See*—
Groke, Ulrich, 4,403,651, Cl. 165-104.270.

K-Med, Inc.: *See*—
King, George E., 4,403,616, Cl. 128-725.000.

Kabelwerke Reinshagen GmbH: *See*—
Eder, Bernd; and Wosthoff, Eckehard, 4,404,463, Cl. 219-541.000.

Kabushiki Kaisha Akashi Seisakusho: *See*—
Shibano, Makoto; Kakuma, Hideaki; and Yasuyama, Hisatake, 4,403,511, Cl. 73-665.000.

Kabushiki Kaisha Gosl: *See*—
Miyake, Mitsunori, 4,403,486, Cl. 70-383.000.

Kabushiki Kaisha Johnan Seisakusho: *See*—
Ishii, Kimichi, 4,403,450, Cl. 49-352.000.

Kabushiki Kaisha Sanesu Shoko: *See*—
Aoyama, Tadamasa, 4,404,626, Cl. 364-174.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Komatsu, Shoichi; and Iwamatsu, Seiichi, 4,404,236, Cl. 427-94.000.
Yamazaki, Suguru, 4,404,624, Cl. 363-59.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Thujiuchi, Yoshio; and Sumi, Yorinobu, 4,403,829, Cl. 350-289.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kato, Kimio; Koso, Hiroya; and Kobayashi, Hisao, 4,403,921, Cl. 417-296.000.

Kabushiki Kaisha Yoshida Seisakusho: *See*—
Hatakeyama, Narito, 4,403,959, Cl. 433-126.000.

Kafer, Peter; Morbitzer, Leo; Neuray, Dieter; Cohnen, Wolfgang; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Process for the isolation of polycarbonates based on 4,4'-dihydroxydiphenyl sulphones. 4,404,351, Cl. 528-174.000.

Kafka, Charles F.: *See*—
Kafka, Robert S.; and Kafka, Charles F., 4,403,799, Cl. 292-285.000.

Kafka, Robert S.; and Kafka, Charles F., to Meachum Marine Products, Inc. Flush hasp having foldable, upstanding latching portion, and optionally usable with padlock. 4,403,799, Cl. 292-285.000.

Kagawa, Seiji. Igniter utilizing piezo-electric element. 4,403,946, Cl. 431-255.000.

Kageyama, Hidehei; and Suzuki, Takahiko, to Kotobuki & Co., Ltd. Spare lead holder. 4,403,691, Cl. 206-214.000.

Kaiser Steel Corporation: *See*—
Bautz, James E., 4,404,634, Cl. 364-472.000.

Kaji, Ryoji: *See*—
Kawatani, Kimio; and Kaji, Ryoji, 4,404,034, Cl. 106-238.000.

Kakehi, Masanori; Higashida, Yoshitaka; Iwamoto, Kenzo; and Kano, Hikaru, to Mitsuboshi Belting Ltd. Method of joining waterproof vulcanized synthetic rubber sheets. 4,404,056, Cl. 156-244.110.

Kakuma, Hideaki: *See*—
Shibano, Makoto; Kakuma, Hideaki; and Yasuyama, Hisatake, 4,403,511, Cl. 73-665.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Lohn, Gerd, 4,403,958, Cl. 433-100.000.
Mossle, Walter; Lingenhole, Bernhard; and Eibofner, Eugen, 4,403,957, Cl. 433-29.000.

Kalu, Georgina; and Markus, Michael, to ICI Australia Limited. Products and processes. 4,404,051, Cl. 149-37.000.

Kamei, Takao: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,403,996, Cl. 44-1.00G.

Kaminsky, Walter O.: *See*—
Sinn, Hansjorg W.; Kaminsky, Walter O.; Vollmer, Hans-Jurgen C.; and Woldt, Rudiger O. H. H., 4,404,344, Cl. 526-160.000.

Kamuro, Setsufumi; and Masaki, Yoshifumi, to Sharp Kabushiki Kaisha. Semiconductor device system. 4,404,654, Cl. 365-103.000.

Kanamaru, Hisanobu: *See*—
Tomite, Tosio; Ogasawara, Nobuhiko; Isii, Kaniti; and Kanamaru, Hisanobu, 4,403,402, Cl. 29-598.000.

Kane, David M. Collapsible tube compressing paste dispenser. 4,403,714, Cl. 222-101.000.

Kane, Patrick J. Apparatus for driving fasteners and other insertable objects into remote structures. 4,403,892, Cl. 408-95.000.

Kanebo Cosmetics, Inc.: *See*—
Yoshida, Jun; Tsunemitsu, Toshiharu; and Nakano, Masayoshi, 4,403,963, Cl. 434-100.000.

Kanno, Yoshihiro: *See*—
Sakakibara, Takaaki; and Kanno, Yoshihiro, 4,404,423, Cl. 174-27.000.

Kano, Hikaru: *See*—
Kakehi, Masanori; Higashida, Yoshitaka; Iwamoto, Kenzo; and Kano, Hikaru, 4,404,056, Cl. 156-244.110.

Kansai Paint Co., Ltd.: *See*—
Higuchi, Tetsuo; Takagi, Teiitsu; Fujitani, Toshihide; and Haruta, Yasuhiko, 4,404,318, Cl. 524-588.000.

Kanto Denka Kogyo Co., Ltd.: *See*—
Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, 4,404,024, Cl. 75-0.5BA.

Kaplan, S. Richard. Heel lift. 4,403,426, Cl. 36-36.00R.

Karchevski, Robert A., to GTE Automatic Electric Incorporated. Frame detection and synchronization system for high speed digital transmission systems. 4,404,675, Cl. 371-47.000.

Karl Mengele & Sohne Maschinenfabrik und Eisengiesserei GmbH & Co.: *See*—
Holtschmidt, Arthur, 4,403,498, Cl. 72-455.000.

Kasahara, Junkichi; Nagashita, Mitsuyoshi; and Honda, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Copying apparatus with slidably attached sorter bin. 4,403,771, Cl. 271-294.000.

Kasap, Ahmet: *See*—
Babbitt, Gerald J.; and Kasap, Ahmet, 4,403,611, Cl. 604-73.000.

Kashiwa, Norio: *See*—
Ushida, Yoshihisa; Toyota, Akinori; and Kashiwa, Norio, 4,404,341, Cl. 526-125.000.

Kasimov, Dzhangir A. K. O.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,403,631, Cl. 138-130.000.

Kato, Hiroshi: *See*—
Ohyama, Sadahiro; Kato, Hiroshi; and Matsukawa, Kazuo, 4,404,617, Cl. 361-424.000.

Kato, Kimihiro: *See*—
Nagasaku, Eiichi; Yasunaga, Masao; and Kato, Kimihiro, 4,403,929, Cl. 418-82.000.

Kato, Kimio; Kono, Hiroya; and Kobayashi, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Multi-cylinder variable delivery compressor. 4,403,921, Cl. 417-296.000.

Katsuki, Yoshimasa: *See*—
Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, 4,403,954, Cl. 432-124.000.

Katsura, Tadahiko: *See*—
Hirota, Kazumi; Tsutsumi, Yotaro; Ito, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; and Hori, Ichiro, 4,403,710, Cl. 220-270.000.

Katsuragi, Shigeru, to Ricoh Company, Ltd. Printing head drive circuit for thermal printer. 4,404,567, Cl. 346-76.0PH.

Katsuyama, Kazuki: *See*—
Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, 4,404,352, Cl. 528-45.000.

Katz, Ami, to Electra (Israel) Ltd. Integrated heat pump and heat storage system. 4,403,731, Cl. 237-2.00B.

Katzen, Stanley J.: *See*—
Speca, Anthony N.; Katzen, Stanley J.; and Rekers, Louis J., 4,404,340, Cl. 526-97.000.

Kaufman, Benjamin J.; Herbstman, Sheldon; and Levin, Mark, to Texaco Inc. Detergent and corrosion inhibitor and motor fuel composition containing same. 4,404,001, Cl. 44-63.000.

Kawagishi, Yoji; Ishida, Yukihiko; and Ishikawa, Kazuhiro, to Orient Chemical Industries, Ltd. Metal complexes for use in developers for electrostatic images, charge control function. 4,404,271, Cl. 430-110.000.

Kawai, Taneichi: *See*—
Nishida, Koji; and Kawai, Taneichi, 4,404,508, Cl. 318-611.000.

Kawai, Yoshihiko: *See*—
Yasuda, Isao; Koyama, Kazuaki; and Kawai, Yoshihiko, 4,404,608, Cl. 360-126.000.

Kawamura Institute of Chemical Research: *See*—
Kitamura, Taku, 4,404,354, Cl. 528-86.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,403,996, Cl. 44-1.00G.
Takagi, Izumi, 4,403,976, Cl. 474-19.000.

Kawasaki Steel Corporation: *See*—
Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, 4,404,030, Cl. 106-2.000.

Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, to Yamanouchi Pharmaceutical Co., Ltd. Sustained release pharmaceutical composition of solid medical material. 4,404,183, Cl. 424-19.000.

Kawatani, Kimio; and Kaji, Ryoji, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Process for preparing aqueous dispersion of rosin-base materials. 4,404,034, Cl. 106-238.000.

Kawazoe, Mitsuo: *See*—
Maitani, Yoshihisa; and Kawazoe, Mitsuo, 4,403,843, Cl. 354-25.000.

Kay, John F.: *See*—
Canning, John L.; and Kay, John F., 4,404,261, Cl. 428-480.000.

Keane, James W.; and Nordeen, Erwin E., to Whirlpool Corporation. Vacuum cleaner brush having string guard means. 4,403,372, Cl. 15-339.000.

Keeton, John H. Hand held herbicide applicator with flexible cap and valve element. 4,403,881, Cl. 401-202.000.

Keim, Thomas A.; and Minnich, Stephen H., to General Electric Company. Star connected air gap polyphase armature having limited voltage gradients at phase boundaries. 4,404,486, Cl. 310-198.000.

Kelley, Douglas P.: *See*—
Reichman, James M.; and Kelley, Douglas P., 4,403,667, Cl. 175-230.000.

Kelley, Kane L., to Beecham Inc. Phenyl Salicylate as a topical anti-inflammatory. 4,404,198, Cl. 424-235.000.

Kempe, Eberhard: *See*—
Heider, Manfred; Hofschneider, Josef; Schallenberger, Wolfgang; Nodes, Franz; and Kempe, Eberhard, 4,404,284, Cl. 435-291.000.

Kenan, Richard P.; and Verber, Carl M., to Battelle Memorial Institute. Electrooptical multipliers. 4,403,833, Cl. 350-356.000.

Kendall Company, The: *See*—
Binard, William J.; Ciarico, Anthony J.; Anglada, Leonard R.; and Patel, Bhupendra C., 4,403,988, Cl. 604-118.000.

Keogh, Michael J., to Union Carbide Corporation. Polysiloxanes having combined therein organo titanates. 4,404,349, Cl. 528-25.000.

Kern, Hans, to Lang Apparatebau GmbH. Device for spraying aqueous mixtures. 4,403,738, Cl. 239-313.000.

Kerr, John F., to Appleton Papers Inc. Controllably heated clothing. 4,404,460, Cl. 219-211.000.

Kevvai, Arnold A.: *See*—
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Khaichkis, Roza: *See*—
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Khalil, Hamdy: *See*—
Koski, Unto K.; Khalil, Hamdy; and Cassola, Adrian, 4,404,300, Cl. 524-91.000.

Kidde, Inc.: *See*—
Wuthrich, Werner, 4,403,981, Cl. 493-419.000.

Kiddie Products, Inc.: *See*—
Panicci, Richard L., 4,403,613, Cl. 128-360.000.

Kiefer, Werner; and Sura, Maria, to Schott Glaswerke. Low-density, open-pore molded inorganic body with a homogeneous pore distribution. 4,404,291, Cl. 501-81.000.

Kiernan, Jane A.: *See*—
Baker, Pamela K.; and Kiernan, Jane A., 4,404,222, Cl. 424-304.000.

Kihara, Toshimasa; and Inoue, Toshifumi, to Hitachi, Ltd. Programmable read only memory. 4,404,659, Cl. 365-185.000.

Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Printer. 4,404,568, Cl. 346-76.0PH.

Kimball International, Inc.: *See*—
Fritz, Gary R.; and Robinson, John W., 4,403,537, Cl. 84-345.000.
Weil, Robert A., Jr.; Eck, Gary A.; and Fritz, Gary R., 4,403,536, Cl. 84-1.010.

Kincaid, John W.: *See*—
King, William A.; and Kincaid, John W., 4,404,424, Cl. 174-34.000.

King, George E., to K-Med, Inc. Expiratory breathing exercise device. 4,403,616, Cl. 128-725.000.

King, Patrick F.: *See*—
Idelson, Elbert M.; and King, Patrick F., 4,404,136, Cl. 260-147.000.

King, William A.; and Kincaid, John W., to Cooper Industries, Inc. Shielded twisted-pair flat electrical cable. 4,404,424, Cl. 174-34.000.

Kinishi, Ryoichi: *See*—
Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, 4,404,352, Cl. 528-45.000.

Kinjo, Hisao; and Ozawa, Keiji, to Victor Company of Japan, Ltd. Laser recording information and pilot signals for tracking on a grooveless recording. 4,404,599, Cl. 358-342.000.

Kinnaman, Daniel L.: *See*—
Warren, Eugene D.; Martin, Lawrence M.; and Kinnaman, Daniel L., 4,404,603, Cl. 360-33.100.

Kinney, Dwayne R.; and Sinn, Herman H., to Electronic Components Groupe, Inc. Convertible alternate action/momentary pushbutton switch. 4,404,444, Cl. 200-153.00J.

Kinoshita, Katsuharu: *See*—
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; and Sato, Toyohiro, 4,404,533, Cl. 335-131.000.

Kintek, Inc.: *See*—
Blackmer, David E., 4,404,427, Cl. 179-1.0VL.

Kiraly, Ernest F.; and Ortiz, Ernest A., to Warner-Lambert Company. Socket device for a pivotal razor. 4,403,414, Cl. 30-57.000.

Kirk, Kenneth L., to Amtrol Inc. Process of preparing a double wall heat exchanger. 4,403,385, Cl. 29-157.3AH.

Kirn, Larry J. High fidelity audio encoder/amplifier. 4,404,526, Cl. 330-10.000.

Kitamura, Takashi, to Canon Kabushiki Kaisha. Multibeam recording apparatus. 4,404,571, Cl. 346-108.000.

Kitamura, Taku, to Dainippon Ink and Chemicals, Inc.; and Kawamura Institute of Chemical Research. Polyphenylene-type polymeric compound and process for production thereof. 4,404,354, Cl. 528-86.000.

Kitamura, Yoichi; Hotta, Hisashi; Yurita, Chikara; and Ito, Makoto, to Toyo Seikan Kaisha, Limited. Method of manufacturing a welded can body. 4,404,447, Cl. 219-64.000.

Kits van Heyningen, Arent H., to Raytheon Company. Sea bottom slope compensation apparatus. 4,404,665, Cl. 367-100.000.

Kitsunai, Tomoyuki: *See*—
Saito, Kiyotaka; Kitsunai, Tomoyuki; and Hori, Shozo, 4,404,322, Cl. 525-74.000.

Kiyooka, Katsumi, to Komatsu Zenoah Co. Debris collecting device. 4,403,371, Cl. 15-328.000.

Klaren, Dick G., to Esmil BV. Apparatus for flow of a liquid medium. 4,403,650, Cl. 165-104.160.

Klein, Howard P.; and Speranza, George P., to Texaco Inc. Process for preparing hydroxy-containing amine complexes which are useful as catalysts for trimerizing isocyanates and preparing polyurethanes. 4,404,120, Cl. 252-426.000.

Klein, Howard P.; and Speranza, George P., to Texaco Inc. Process for preparing polyol-catalyst mixtures useful in the preparation of rigid polyurethane cellular products. 4,404,121, Cl. 252-426.000.

Kleinbohl, Helmut, to General Motors Corporation. Instrument panel for vehicles. 4,403,818, Cl. 339-10.000.

Kleinecke, John D.: *See*—
Stich, Frederick A.; Kleinecke, John D.; and Robertson, Roger L., 4,404,442, Cl. 200-144.00R.

Kleinert, Helmuth, to Siemens Aktiengesellschaft. Method and circuit arrangement for transmitting binary signals between peripheral units which are connected to one another via a central bus line system. 4,404,650, Cl. 364-900.000.

Kleinlogel, Horst: *See*—
Matejcek, Milan; Theohar, Carl; and Kleinlogel, Horst, 4,404,226, Cl. 424-326.000.

Kleinschmidt, Peter, to Siemens Aktiengesellschaft. Pyrodetector. 4,404,468, Cl. 250-342.000.

Kleinschmidt, Peter: *See*—
Magori, Valentin; and Kleinschmidt, Peter, 4,404,502, Cl. 318-116.000.

Kley & Associates: *See*—
Kley, Victor B., 4,403,834, Cl. 350-371.000.

Kley, Victor B., to Kley & Associates. Acoustic-wave device. 4,403,834, Cl. 350-371.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Schmahl, Theo, 4,403,671, Cl. 180-53.00R.

Knapp, Alfons: *See*—
Knapp, Francesco; and Knapp, Alfons, 4,403,739, Cl. 239-428.500.

Knapp, Francesco; and Knapp, Alfons. Device for aerating a jet of water. 4,403,739, Cl. 239-428.500.

Kniga, Anatoly N.: *See*—
Zybailo, Valentin P.; Kniga, Anatoly N.; Kosyan, Ljudmila E.; Rudenko, Valentin P.; and Poltaev, Sergei A., 4,404,547, Cl. 340-365.00R.

Knoblauch, Karl; Richter, Ekkehard; Giessler, Klaus; and Korbacher, Werner, to Bergwerksverband GmbH. Method for separating gas mixtures by means of pressure changing adsorption technique. 4,404,004, Cl. 55-25.000.

Kobashigawa, Don: *See*—
Sanders, James B.; and Kobashigawa, Don, 4,403,625, Cl. 132-91.000.

Kobayashi, Hisamine, to Shikishima Tipton Mfg. Co., Ltd. Vibratory barrel finishing machine. 4,403,456, Cl. 51-163.200.

Kobayashi, Hisao: *See*—
Kato, Kimio; Kono, Hiroya; and Kobayashi, Hisao, 4,403,921, Cl. 417-296.000.

Kobayashi, Kazuyoshi: *See*—
Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozseki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.

Kobayashi, Ryoichi: *See*—
Yamada, Kazuji; Nishihara, Motohisa; Sato, Hideo; Suzuki, Seiko; and Kobayashi, Ryoichi, 4,404,539, Cl. 338-3.000.

Kobayashi, Seiji; and Harada, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Intake duct for an outboard engine. 4,403,971, Cl. 440-88.000.

Kobayashi, Shigeki; Iwasaki, Norio; Ikeda, Yasunori; Miyake, Tamio; and Tanimura, Shigeru, to Omron Tateisi Electronics Co. Blood cell identification and classification system. 4,404,683, Cl. 382-6.000.

Kobe Steel, Ltd.: *See*—
Rokujio, Masaharu; Ogasawara, Takaaki; and Usui, Mitunori, 4,404,457, Cl. 219-137.200.

Kober, Heinrich: *See*—
Kohler, Robert; Schilffarth, Karlchristian; Kober, Heinrich; and Nippe, Burkhard, 4,404,253, Cl. 428-327.000.

Koch, Friedo: *See*—
Joseph, Horst D.; and Koch, Friedo, 4,403,620, Cl. 131-280.000.

Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, to Hermann Berstorff Maschinenbau GmbH. Extraction device for removing liquid from a liquid-solid mixture. 4,404,101, Cl. 210-232.000.

Koch, Robert E.; and Bergh, Daniel D., to Electric Power Research Institute, Inc. Surge arrester having a non-fragmenting outer housing. 4,404,614, Cl. 361-128.000.

Kochar, Nand K.; and Ozero, Brian J., to Halcon SD Group, Inc., The. Coproduction of aniline and diphenylamine. 4,404,399, Cl. 564-407.000.

Kocher, Jakob: *See*—
Aulhorn, Elfriede; Kocher, Jakob; and Reiner, Josef, 4,403,842, Cl. 351-237.000.

Kochey, Edward L., *Jr.*, to Combustion Engineering, Inc. Boiler with economizer heat absorption reduction. 4,403,571, Cl. 122-1.00A.

Kocot, Ray H.; Rudd, Robert E., III; and Arnoldi, Douglas R., to Burroughs Corporation. Electrostatic ink jet system. 4,404,573, Cl. 346-140.00R.

Kodama, Hideyo: *See*—
Akahori, Kimihiko; Maeno, Shigeo; Kodama, Hideyo; and Morinada, Norio, 4,404,041, Cl. 148-2.000.

Kodama, Hiroshi, to Toyo Kogyo Co., Ltd. Multi-piece apex seal structure for a rotary piston engine. 4,403,930, Cl. 418-121.000.

Kodera, Masao; Akita, Sigeyuki; and Yoshino, Yasuhisa, to Nippon Soken, Inc. Rear obstacle detecting system for automotive vehicles. 4,404,541, Cl. 340-32.000.

Kohara, Masanori: *See*—
Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, 4,404,352, Cl. 528-45.000.

Kohl, Paul A.; and Ostermayer, Frederick W., *Jr.*, to Bell Telephone Laboratories, Incorporated. Photoelectrochemical processing of III-V semiconductors. 4,404,072, Cl. 204-129.300.

Kohler, Robert; Schilffarth, Karlchristian; Kober, Heinrich; and Nippe, Burkhard, to Agfa-Gevaert Aktiengesellschaft. Magnetic recording medium. 4,404,253, Cl. 428-327.000.

Koike, Eishi, to Ozen Corporation. Sound reproducing device driven by a constant torque pull string type spring and started by selective starter rods for playing multiple record grooves. 4,404,667, Cl. 369-65.000.

Koiso, Junichi: *See*—
Hirabayashi, Tsugio; and Koiso, Junichi, 4,403,852, Cl. 355-15.000.

Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, to Sharp Kabushiki Kaisha. Mode selection assembly for use in tape recorders or the like. 4,404,610, Cl. 360-137.000.

Kojima, Michio: *See*—
Ito, Tatsuo; Shomura, Takashi; Kojima, Michio; Ezaki, Norio; Sezaki, Masaji; and Niwa, Tomizo, 4,404,218, Cl. 424-274.000.

Kojima, Shigeru: *See*—
Sakamoto, Yoichi; Ibata, Akihiko; Kojima, Shigeru; and Ohtani, Tadao, 4,404,046, Cl. 148-101.000.

Kojima, Tadashi: *See*—
Hoshimi, Susumu; and Kojima, Tadashi, 4,404,602, Cl. 360-13.000.

Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, to Kubota, Ltd. Apparatus for heat-treating pipes. 4,403,954, Cl. 432-124.000.

Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. 2-Oxo-2,6,7,8,9,10 hexahydro-pyrimido[1,2-a]azepines and antianginal method of use thereof and of 4-oxo-4,6,7,8,9,10-hexahydropyrimido[1,2-a]azepines. 4,404,205, Cl. 424-251.000.

Kokubu, Tokio; and Take, Katsuo, to Toyo Boseki Kabushiki Kaisha. Fiber-reinforced polymer blend composition. 4,404,312, Cl. 524-504.000.

Koller, Frank H.; Peterson, Jeffrey P.; and Snizek, Robert E., to Emerson Electric Co. Cam-driven rotary pick-and-place assembly apparatus. 4,403,907, Cl. 414-744.00R.

Koltz, Irvine M. Collapsible gable top container. 4,403,728, Cl. 229-39.00R.

Komai, Keiichi: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,403,996, Cl. 44-1.00G.

Komarek, Jaromir: *See*—
Gebert, Ulrich; Thorwart, Werner; Komarek, Jaromir; and Cartheuser, Carl, 4,404,384, Cl. 544-394.000.

Komatsu, Shigeru: *See*—
Hirahata, Shigeru; Ikeda, Tetsuya; Tachiuchi, Tsuguji; Komatsu, Shigeru; and Takezawa, Teruhiro, 4,404,552, Cl. 340-721.000.

Komatsu, Shoichi; and Iwamatsu, Seiichi, to Kabushiki Kaisha Suwa Seikosha. High pressure chemical vapor deposition. 4,404,236, Cl. 427-94.000.

Komatsu Zenoah Co.: *See*—
Kiyooka, Katsumi, 4,403,371, Cl. 15-328.000.

Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, to Kawasaki Steel Corporation. Anti-plating agent for one-side hot-dip plating process. 4,404,030, Cl. 106-2.000.

Komura, Tamotsu: *See*—
Tsunekawa, Masayoshi; Miyoshi, Nobuyoshi; and Komura, Tamotsu, 4,404,150, Cl. 260-927.00R.

Kondo, Hideo, to Muroran Institute of Technology. Wave energy absorber mountable on wave-facing structure. 4,403,475, Cl. 60-398.000.

Kondo, Toshikatsu: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; Joruka, Masao; and Sakaida, Atsuo, 4,403,875, Cl. 400-124.000.

Konishi, Nobutake; Naito, Masayoshi; Yatsuo, Tsutomu; and Terasawa, Yoshio, to Hitachi, Ltd. Light activated semiconductor device. 4,404,580, Cl. 357-38.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Hirabayashi, Tsugio; and Koiso, Junichi, 4,403,852, Cl. 355-15.000.

Kasahara, Junkichi; Nagashita, Mitsuyoshi; and Honda, Hiroyuki, 4,403,771, Cl. 271-294.000.
Konno, Koji: *See*—
Yanaihara, Noboru; and Konno, Koji, 4,404,133, Cl. 260-112.50R.
Kono, Hiroya: *See*—
Kato, Kimio; Kono, Hiroya; and Kobayashi, Hisao, 4,403,921, Cl. 417-296.000.
Koon, Randy G.: *See*—
Glore, Thomas G.; and Koon, Randy G., 4,403,454, Cl. 51-135.0BT.
Kopczynski, John F. Dump bin. 4,403,901, Cl. 414-422.000.
Kopp, Manfred K.; and Valentine, Kenneth H. Neutron flux profile monitor for use in a fission reactor. 4,404,164, Cl. 376-154.000.
Koppensteiner, James V.; and Onesto, Joseph B., to GTE Automatic Electric Labs Inc. Printed circuit card extracting tool. 4,403,408, Cl. 29-764.000.
Kopse, Odon: *See*—
Eblen, Ewald; Hofmann, Karl; and Kopse, Odon, 4,403,740, Cl. 239-533.400.
Korbacher, Werner: *See*—
Knoblauch, Karl; Richter, Ekkehard; Giessler, Klaus; and Korbacher, Werner, 4,404,004, Cl. 55-25.000.
Korchin, Herbert P. Submersible pump. 4,403,923, Cl. 417-360.000.
Kords, Christian: *See*—
Bernert, Claus-Rudiger; Hartwig, Volker; Kords, Christian; and Redeker, Detmar, 4,404,370, Cl. 536-85.000.
Korobova, Emma S.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.
Koski, Unto K.; Khalil, Hamdy; and Cassola, Adrian, to Polysar Limited. Polystyrene process. 4,404,300, Cl. 524-91.000.
Koss Corporation: *See*—
Pelt, Thomas E.; and Besasie, Joseph C., 4,404,434, Cl. 179-156.00R.
Koss, William H.; and Smith, Richard J., to McGill Manufacturing Company, Inc. Method for locking an anti-friction bearing to a shaft and apparatus for accomplishing the same. 4,403,814, Cl. 308-236.000.
Kosyan, Ljudmila E.: *See*—
Zybailo, Valentin P.; Kniga, Anatoly N.; Kosyan, Ljudmila E.; Rudenko, Valentin P.; and Poltaev, Sergei A., 4,404,547, Cl. 340-365.00R.
Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei; and Suzuki, Takahiko, 4,403,691, Cl. 206-214.000.
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Salt-like products of the addition of phenols onto amino organosilane esters and method for the preparation thereof and use as a preservative. 4,404,014, Cl. 71-67.000.
Kovalenko, Eugene N.: *See*—
Bowen, John G.; and Kovalenko, Eugene N., 4,403,589, Cl. 123-525.000.
Kowal, Leonard J., to Imperial Clevite Inc. Tube bender construction. 4,403,496, Cl. 72-388.000.
Koyama, Kazuaki: *See*—
Yasuda, Isao; Koyama, Kazuaki; and Kawai, Yoshihiko, 4,404,608, Cl. 360-126.000.
Koyo-Jido-Ki Co., Ltd.: *See*—
Yamashita, Kyoichi, 4,403,719, Cl. 226-188.000.
Kracl, David L. Down marker indicator for football competition. 4,404,543, Cl. 340-323.00R.
Kraftwerk Union Aktiengesellschaft: *See*—
Kral, Rudolf; and Engelhardt, Reiner, 4,403,575, Cl. 122-451.100.
Krage, Mark K.; and Meduvsky, Alexander, to General Motors Corporation. Engine testing microwave transmission device. 4,403,504, Cl. 73-116.000.
Krajci, Gary E.: *See*—
Pollard, David D.; and Krajci, Gary E., 4,404,582, Cl. 357-79.000.
Kral, Rudolf; and Engelhardt, Reiner, to Kraftwerk Union Aktiengesellschaft. Device for preventing flashing to steam in an economizer of a flow through steam generator. 4,403,575, Cl. 122-451.100.
Krambeck, Frederick J.: *See*—
Haddad, James H.; and Krambeck, Frederick J., 4,404,095, Cl. 208-161.000.
Krampe, Dietrich; and Heyl, Tilo, to Siemens Aktiengesellschaft. Apparatus for automatically switching off and disconnecting an electric motor shaft drive accelerating a winding bobbin once a circumferential cylinder drive has become effective. 4,404,501, Cl. 318-7.000.
Kranenburg, Simon V.: *See*—
Cloosterman, Aloysius B. M.; and Kranenburg, Simon V., 4,404,228, Cl. 426-98.000.
Kraus, Hubert: *See*—
Almahmoud, Saad; Kraus, Hubert; and Riepl, Martin, 4,403,381, Cl. 29-25.420.
Kremer, Victor: *See*—
Mailliet, Pierre; and Kremer, Victor, 4,403,516, Cl. 73-863.110.
Kremer, Wolfgang: *See*—
Traenckner, Hans-Joachim; and Kremer, Wolfgang, 4,404,298, Cl. 524-31.000.
Kretschmer, Frank F., Jr.; and Lewis, Bernard L., to United States of America, Navy. Low sidelobe linear FM chirp system. 4,404,562, Cl. 343-17.2PC.
Kretz, Carl, to Kretztechnik Gesellschaft mbH. Ultrasonic equipment for examinations using section images. 4,403,509, Cl. 73-639.000.
Kretztechnik Gesellschaft mbH: *See*—
Kretz, Carl, 4,403,509, Cl. 73-639.000.
Krishnamumar, Suppayan M.; and Jolly, Walter R., to Continental Group, Inc., The. Blow head valve. 4,403,940, Cl. 425-529.000.
Kubota, Ltd.: *See*—
Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, 4,403,954, Cl. 432-124.000.
Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, to Adeka Argus Chemical Co., Ltd. Polymeric light stabilizers having at least one 2,2,6,6-tetraalkyl piperidyl group and synthetic resin compositions containing the same. 4,404,301, Cl. 524-99.000.
Kubota, Tsutomu: *See*—
Goto, Jugo; Mochizuki, Kazutaka; Kubota, Tsutomu; and Miyamoto, Reiji, 4,404,320, Cl. 525-58.000.
Kuder, James E., to Celanese Corporation. Electrochemical production of 2,6-diaminobenzobisthiazole. 4,404,070, Cl. 204-72.000.
Kufrin, Fred W., to Fox Valley Corporation (Breneman Div.). Window shade roller with shade cutting assembly. 4,403,415, Cl. 30-96.000.
Kufrin, Robert: *See*—
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,404,295, Cl. 521-172.000.
Kuhlen, Ernst; and Winkels, Manfred, to Pierburg GmbH & Co. KG. Diaphragm fuel pump and associated method. 4,403,925, Cl. 417-395.000.
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt. Synergistic antimicrobial compositions. 4,404,189, Cl. 424-114.000.
Kulprathipanja, Santi: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,404,145, Cl. 260-419.000.
Kummerlin, Walter. Hinge fitting for foldable ladders. 4,403,373, Cl. 16-327.000.
Kumpar, Zvonimir Z., to SKF Industrial Trading & Development Company B.V. Method for making a device for converting a rotary motion into a linear motion. 4,403,522, Cl. 74-89.000.
Kumpe, Gerhardt: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Preis, Hans M., 4,404,187, Cl. 424-101.000.
Kunczynski, Jan K. Detachable grip assembly and method. 4,403,552, Cl. 104-206.000.
Kupka, Dieter. Agitator with two sets of blades each driven in an opposite direction about a common axis. 4,403,868, Cl. 366-295.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Satoh, Hiroaki; Tabata, Yasuyuki; Gomikawa, Kouichi; and Hiruta, Masaru, 4,404,171, Cl. 422-241.000.
Yanaihara, Noboru; and Konno, Koji, 4,404,133, Cl. 260-112.50R.
Kuribayashi, Hiroshi; and Ikeda, Atsuo, to Pioneer Electronic Corporation. Linear drive motor control system. 4,404,671, Cl. 369-216.000.
Kurihara, Michio: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,403,996, Cl. 44-1.00G.
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; and Sato, Toyohiro, to Honda Giken Kogyo Kabushiki Kaisha. Electromagnetic switch device. 4,404,533, Cl. 335-131.000.
Kusakabe, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Stereo identifying signal detection device. 4,404,432, Cl. 179-1.0GS.
Kusters, Eduard: *See*—
Kutz, Johannes, 4,403,359, Cl. 8-149.100.
Kutz, Johannes, to Kusters, Eduard. Method for washing out thickening from printed textile materials in web form. 4,403,359, Cl. 8-149.100.
Kyogoku, Hiroshi: *See*—
Okamura, Shigeru; Kyogoku, Hiroshi; and Tazaki, Shigemitsu, 4,404,572, Cl. 346-140.00R.
Kyohno, Kazuaki: *See*—
Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, 4,404,030, Cl. 106-2.000.
Kyosuke, Kato. Oil splash and fire-proof lid. 4,403,711, Cl. 220-335.000.
L & H Designs Limited: *See*—
Richards, Edwin H., 4,403,409, Cl. 29-798.000.
L-N International, Inc.: *See*—
Locke, C. Joseph, 4,403,528, Cl. 81-3.46R.
La Baw, Glenn D.: *See*—
Pomper, Seymour; and La Baw, Glenn D., 4,404,227, Cl. 426-19.000.
Laboratoires Sophartex: *See*—
Goutard, Rene-Michel; and Piry, Pierre, 4,403,461, Cl. 53-282.000.
Laborde, Alice L.: *See*—
Dolak, Lester A.; Reusser, Fritz; Castle, Thomas M.; Hannon, Betty R.; Laborde, Alice L.; and Marschke, Charles K., 4,404,190, Cl. 424-118.000.
Lach, Dietrich; Streicher, Rolf; and Bolz, Gerhard, to BASF Aktiengesellschaft. Preparation of water-soluble or self-dispersing resin tanning agents. 4,403,993, Cl. 8-94.240.
Ladner, David W.; and Cross, Barrington, to American Cyanamid Company. Aniline intermediates. 4,404,402, Cl. 564-442.000.
Ladwig, Allen N.: *See*—
Bland, Gerald F.; and Ladwig, Allen N., 4,403,972, Cl. 440-88.000.
Laffitte, Denis R. G.; Louis, Guy H.; and Raybaud, Alain M. M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Turbine distributor vane. 4,403,917, Cl. 416-96.00A.

Lagace, Linda S.; and Young, David A., to Exxon Research & Engineering Co. Process for recovery of cobalt oxo catalysts. 4,404,119, Cl. 252-413.000.

Lamborn, Calvin R., to Sandoz, Ltd. Method of selecting stringless beans. 4,403,445, Cl. 47-58.000.

Lampe, Siegfried; and Lehmann, Heinz, to E.C.H. Will (GmbH & Co.). Apparatus for gathering writing pads or the like. 4,403,899, Cl. 414-35.000.

Landry, Jean-Marie: *See*—
Grosjean, Jean-Claude; and Landry, Jean-Marie, 4,403,768, Cl. 266-44.000.

Lane, Stephen P.: *See*—
Howse, Peter; Cookson, Dennis; and Lane, Stephen P., 4,404,551, Cl. 340-711.000.

Lang Apparatebau GmbH: *See*—
Kern, Hans, 4,403,738, Cl. 239-313.000.

Lang, Walter H.; and Muchel, Franz, to Carl Zeiss-Stiftung. Apparatus for examining anterior portions of the eye. 4,403,841, Cl. 351-215.000.

Lang, William C., to General Tire & Rubber Company, The. Optimum method of milling rubber. 4,404,364, Cl. 528-502.000.

Langlois, Gary N. Locating interfaces in vertically-layered materials and determining concentrations in mixed materials utilizing acoustic impedance measurements. 4,403,508, Cl. 73-589.000.

Lantermann, Heinz, to M.A.N. Maschinenfabrik Augburg-Nurnberg Aktiengesellschaft. Device for regulating the output quantity of a compressed medium. 4,403,920, Cl. 417-295.000.

Larkin, Donald W.: *See*—
Jones, Darryl S.; Larkin, Donald W.; Toner, Michael F.; and Werve, Carleton E., 4,404,647, Cl. 364-900.000.

Larsen, Knut H.: *See*—
Williams, Charles D.; and Larsen, Knut H., 4,404,006, Cl. 55-502.000.

Larson, John D., III; and Miller, David G., to Hewlett-Packard Company. Acoustic transducer with flexible circuit board terminals. 4,404,489, Cl. 310-334.000.

LaSalle Steel Company: *See*—
Wilks, Gerald W., 4,404,047, Cl. 148-131.000.

Lattion, Andre, to Rieter Machine Works Limited. Method of cleaning spinning rotors and apparatus for carrying out the method. 4,403,472, Cl. 57-302.000.

Laubie, Michel: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,404,206, Cl. 424-258.000.

Laurent, Henry: *See*—
Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, 4,404,141, Cl. 260-397.300.

Laurie, Alexander S.; and Whelan, Robert C., to Prutec Limited. Method of manufacturing a cadmium sulphide photo-voltaic device. 4,403,398, Cl. 29-572.000.

Lauterbach, Heinz, to Robert Bosch GmbH. Apparatus for the measurement of the mass of a flowing medium. 4,403,506, Cl. 73-204.000.

La Vista, Leonard A. Mannequin head for training. 4,403,962, Cl. 434-94.000.

Lawrence, Noel A. Nail holding and directing device. 4,403,725, Cl. 227-147.000.

Lazar, Gerhard: *See*—
Eichberger, Ernst; and Lazar, Gerhard, 4,404,027, Cl. 75-72.000.

LearAvia: *See*—
Greenwell, Jack, 4,404,512, Cl. 318-807.000.

Le Baud, Patrice, to Novatome. Apparatus for measuring a parameter relating to at least one substance possibly present in one or several chambers of a set of measurement chambers kept under very low residual pressure. 4,403,500, Cl. 73-19.000.

Lebkuchner, Benno, to Taco, Inc. Method of fabricating a wet-rotor circulator and circulator produced thereby. 4,404,483, Cl. 310-42.000.

Lebrun, Jean-Paul R.: *See*—
Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., 4,404,045, Cl. 148-31.500.

Leco Corporation: *See*—
Sitek, George J.; and Haigh, Richard B., 4,404,461, Cl. 219-490.000.

Ledbetter, Stephen G.; Singleton, Michael P.; Johns, Thomas J.; and Fabian, James L., to RM Industrial Products Company, Inc. Expansion joints. 4,403,796, Cl. 285-223.000.

Lee, Gim F., Jr.: *See*—
Abolins, Visvaldis; Goossens, John C.; Holub, Fred F.; and Lee, Gim F., Jr., 4,404,321, Cl. 525-68.000.

Lee, Ming C.: *See*—
Yorke, William J.; Binet, Rejean; Lee, Ming C.; and Bampfield, Howard A., 4,404,050, Cl. 149-2.000.

Le Faou, Daniel: *See*—
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, 4,403,788, Cl. 280-605.000.

Legezin, Nikolai E.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.

Legrand: *See*—
Astier, Jean-Francois; and Bessaguet, Louis, 4,404,449, Cl. 219-69.00V.

Lehmann, Heinz: *See*—
Lampe, Siegfried; and Lehmann, Heinz, 4,403,899, Cl. 414-35.000.

Lehne, Jurgen: *See*—
Ploss, Hartmut; and Lehne, Jurgen, 4,404,169, Cl. 423-35.000.

Leighton, John D. Method and construction for vehicle brake pedal and switch assembly. 4,404,439, Cl. 200-61.890.

Leitgib, Imre, to Usiflamme S.A. Gas lighter for smokers. 4,403,945, Cl. 431-150.000.

Leitner, George J., to Stauffer Chemical Company. Flame retardant-smolder resistant textile backcoating. 4,404,313, Cl. 524-512.000.

Leland R. Rowsell: *See*—
Giel, George J., 4,404,504, Cl. 318-269.000.

Lenz, Herman N.: *See*—
Rogo, Casimir; Lenz, Herman N.; and Holbrook, Michael, 4,403,914, Cl. 415-165.000.

Leoncini, Novello: *See*—
Angelini, Gianfranco; Leoncini, Novello; Pallesi, Bice; and Paoletti, Ugo, 4,404,157, Cl. 264-195.000.

Lesher, M. Kenneth, to Alco Standard Corporation. Apparatus for closing and sealing a doorway. 4,403,448, Cl. 49-225.000.

Leslie, Elmer N.: *See*—
Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,403,558, Cl. 112-121.110.

Leuschner, Horst, to Motorola, Inc. Semiconductor device having reduced capacitance and method of fabrication thereof. 4,404,579, Cl. 357-23.000.

Leveque, Alain; and Triollier, Michel, to Rhone-Poulenc Industries. Purification of solutions of gallium values by serial ion exchange-liquid/liquid extraction. 4,404,174, Cl. 423-112.000.

Lever Brothers Company: *See*—
den Hollander, Cornelis; and Arends, Berend J., 4,404,231, Cl. 426-602.000.
Menon, Kuruvakkat K. G.; Raman, Hariharan; Sarma, Vadali S.; and Subba, Bookinkere C., 4,404,015, Cl. 71-77.000.
Tai, Ho T., 4,404,115, Cl. 252-135.000.

Levin, Mark: *See*—
Kaufman, Benjamin J.; Herbstman, Sheldon; and Levin, Mark, 4,404,001, Cl. 44-63.000.

Levine, Peter A., to RCA Corporation. Electrical compensation for misregistration of striped color filter in a color imager with discrete sampling elements. 4,404,587, Cl. 358-44.000.

Lewis, Bernard L.: *See*—
Kretschmer, Frank F., Jr.; and Lewis, Bernard L., 4,404,562, Cl. 343-17.2PC.

Lewis, Charles B., to Cranston Machinery Company, Inc. Bale strapping system. 4,403,542, Cl. 100-2.000.

Lezan, Georges R. E., to General Electric Company. Pulse shaping and amplifying circuit. 4,404,476, Cl. 307-268.000.

Liang, Chi-Dean, to G. D. Searle & Co. Unsaturated analogs of β-alkyl-β-hydroxy glutaric acid and esters thereof. 4,404,144, Cl. 260-410.90R.

Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., to International Flavors & Fragrances Inc. Oxoalkyl esters, organoleptic uses thereof and process for preparing same. 4,404,307, Cl. 524-290.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Gerstner, Dieter, 4,403,830, Cl. 350-331.00R.

Lilly Industries Limited: *See*—
Chakrabarti, Jiban K.; and Hotten, Terrence M., 4,404,137, Cl. 260-239.30T.

Lin, Peter T., to RCA Corporation. Internal caddy cleaning apparatus. 4,403,369, Cl. 15-304.000.

Lincke, Paul: *See*—
Jankovsky, Frantisek; and Lincke, Paul, 4,403,634, Cl. 139-452.000.

Lindt, Jan T., to University of Pittsburgh. Viscometer for cast foaming materials and associated method. 4,403,502, Cl. 73-55.000.

Ling, John: *See*—
Del Principe, Robert M.; Hostetler, David A.; and Ling, John, 4,403,777, Cl. 273-313.000.

Lingenhole, Bernhard: *See*—
Mossle, Walter; Lingenhole, Bernhard; and Eibofner, Eugen, 4,403,957, Cl. 433-29.000.

Linnau, Yendra: *See*—
Schwarz, Otto; and Linnau, Yendra, 4,404,131, Cl. 260-112.00B.

Lion Corporation: *See*—
Sekiguchi, Shizuo; Miyawaki, Yozo; and Ogoshi, Toshiaki, 4,404,143, Cl. 260-400.000.

Lionelle, Joseph E.; and Staffa, Jeffrey A., to BioSystems Research Inc. Metal oxyalkylates and method of making same. 4,404,146, Cl. 260-429.900.

Lisakla, Peter E. Bucket insert. 4,403,483, Cl. 62-457.000.

Livia, Michael R.; Gould, William S.; and Suhr, Peter J., to Magnetic Analysis Corporation. Tube or bar stock feed system. 4,403,688, Cl. 198-785.000.

Livshits, Vladimir I.; Golovin, Vladimir I.; and Meshkov, Vladimir I. Process for manufacturing panels to be used in microelectronic systems. 4,404,059, Cl. 156-629.000.

Locke, C. Joseph, to L-N International, Inc. Crown cap removing and retaining implement. 4,403,528, Cl. 81-3.46R.

Lodge, Robert H.; Philips, Ian R.; and Reynolds, Mervyn F., to N.J. Phillips Pty. Limited. Gun to implant pellets in animals. 4,403,610, Cl. 604-61.000.

Loeb, Marvin P.: *See*—
Ash, Stephen R.; and Loeb, Marvin P., 4,403,984, Cl. 604-50.000.

Loewrigkeit, Peter; and Dabi, Shmuel, to Witco Chemical Corporation. Color stabilized water-dispersed polyurethane coating on vinyl surfaces. 4,404,258, Cl. 428-424.600.

Lofgren, Folke; and Soderstrom, Sven-Erik, to Asea Aktiebolag. Visibility measuring apparatus using light conductors. 4,403,862, Cl. 356-437.000.

Lohn, Gerd, to Kaltenbach & Voigt GmbH & Co. Dental compressed-air motor. 4,403,958, Cl. 433-100.000.

Lolley, Ted E., to MM Systems Corporation. Conjoint facia. 4,403,458, Cl. 52-60.000.

Long, John R.; Miner, Carla J.; Streater, Richard W.; and Baraff, David R., to Northern Telecom Limited. Addressing scheme for switch controlled liquid crystal displays. 4,404,555, Cl. 340-784.000.

Long, William B.: *See*—
Zimmerman, John A., Jr.; and Long, William B., 4,403,821, Cl. 339-97.00P.

Lonza Ltd.: *See*—
Perlberger, Jean-Claude, 4,404,149, Cl. 260-544.00Y.

Lopez, Robin D. Laundry bag. 4,403,636, Cl. 150-1.000.

Loui, George: *See*—
Sperling, Norman; and Loui, George, 4,403,422, Cl. 33-268.000.

Louis, Guy H.: *See*—
Laffitte, Denis R. G.; Louis, Guy H.; and Raybaud, Alain M. M., 4,403,917, Cl. 416-96.00A.

Lovett, Gordon H., to Monsanto Company. Water extractive distillation of olefinically unsaturated nitriles. 4,404,064, Cl. 203-84.000.

Lovgren, Eric M.: *See*—
Abolins, Visvaldis; Bopp, Richard C.; Caraher, Joel M.; and Lovgren, Eric M., 4,404,125, Cl. 252-511.000.

Lucke, Harold J. Towel and mounting method and means. 4,403,366, Cl. 15-209.00R.

Ludovissie, Anthony W. Device for dispensing a measured amount of a particulate material. 4,403,715, Cl. 222-361.000.

Lueddecke, Erik: *See*—
Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,404,304, Cl. 524-110.000.

Lutz, Eugene F.; and Foster, Elton G., to Shell Oil Company. Oxidation of isobutane under super-critical conditions. 4,404,406, Cl. 568-571.000.

Lyashenko, Alevtina A.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.

Lyncross Pty, Ltd.: *See*—
Gorman, John T., 4,403,734, Cl. 238-372.000.

M.A.N. Maschinenfabrik Augburg-Nurnberg Aktiengesellschaft: *See*—
Lantermann, Heinz, 4,403,920, Cl. 417-295.000.

M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft: *See*—
Matuschke, Walter, 4,403,549, Cl. 101-415.100.

Maccone, Sergio; Dal Moro, Anacleto; Pirozzi, Mario; and Capizzi, Amedeo, to Montedison S.p.A. Slow release formulations of pheromones consisting of aldehydes. 4,404,185, Cl. 424-84.000.

MacCracken, Calvin D., to Calmac Manufacturing Corporation. Compact storage of seat and coolness by phase change materials while preventing stratification. 4,403,645, Cl. 165-10.000.

Mach, Wolfgang: *See*—
Vamvakaris, Christos; Patsch, Manfred; and Mach, Wolfgang, 4,404,389, Cl. 548-201.000.

Machida, Kenji. Impedance measuring device. 4,404,517, Cl. 324-57.00R.

MacLaren, David S. Switching device with separate switching and actuator rods. 4,404,441, Cl. 200-84.00C.

MacMillan Bloedel Limited: *See*—
Hetzler, Bernard H.; and Martin, Hugh V., 4,404,252, Cl. 428-326.000.

Madenburg, Richard S.: *See*—
Drum, Ian; Madenburg, Richard S.; Paulsrude, Douglas M.; Sherman, Carroll H.; Turpin, Frank G.; and Wheatcroft, Gerry A., 4,404,180, Cl. 423-563.000.

Maeda, Akio; Hashimoto, Kinro; Yagishita, Shigelu; Inagami, Masaaki; and Fukushima, Hiroshi, to Nippon Zeon Co., Ltd. Rubber composition capable of giving vulcanizates having improved ozone cracking resistance and oil resistance. 4,404,329, Cl. 525-329.200.

Maeda Metal Industries Ltd.: *See*—
Ikeda, Seiji; and Ono, Katsuyuki, 4,403,529, Cl. 81-56.000.

Maeda, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Fixing device. 4,403,950, Cl. 432-60.000.

Maeda, Tetsuya: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, 4,404,373, Cl. 544-21.000.

Maekawa, Kouzi: *See*—
Miyakawa, Nobuhiro; Maekawa, Kouzi; and Fujii, Masanori, 4,404,269, Cl. 430-106.000.

Maeno, Shigeo: *See*—
Akahori, Kimihiko; Maeno, Shigeo; Kodama, Hideyo; and Morisada, Norio, 4,404,041, Cl. 148-2.000.

Maesk, Stanley J. Barbecue grill. 4,403,595, Cl. 126-25.00A.

Magnetic Analysis Corporrtion: *See*—
Livia, Michael R.; Gould, William S.; and Suhr, Peter J., 4,403,688, Cl. 198-785.000.

Magori, Valentin; and Kleinschmidt, Peter, to Siemens Aktiengesellschaft. Energy saving circuit arrangement for a piezoelectric positioning element. 4,404,502, Cl. 318-116.000.

Magyar, Karoly: *See*—
Benko, Pal; Bozsing, Daniel; Gundel, Janos; and Magyar, Karoly, 4,404,204, Cl. 424-250.000.

Mahajan, Gautam K., to Continental Group, Inc., The. Plastic container with hollow internal rib reinforced bottom and method of forming the same. 4,403,706, Cl. 215-1.00C.

Maier, Alfred E.; and Ricci, Louis N., to Westinghouse Electric Corp. Stored energy circuit breaker with a cam latch. 4,404,446, Cl. 200-320.000.

Mailliet, Pierre; and Kremer, Victor, to Paul Wurth S.A. Furnace probe. 4,403,516, Cl. 73-863.110.

Maitani, Yoshihisa; and Kawazoe, Mitsuo, to Olympus Optical Company Ltd. Switching assembly for focussing, photosensitive elements of a camera. 4,403,843, Cl. 354-25.000.

Makabe, Hachiro; Orii, Akira; and Takahashi, Yoshitaka, to Janome Sewing Machine Co., Ltd. Electronic sewing machine. 4,403,560, Cl. 112-158.00E.

Makino, Kazuhiro, to Hitachi, Ltd. Vertically pivotable boom bending device for crane. 4,403,704, Cl. 212-262.000.

Malen, Donald E.: *See*—
Cogswell, James A., II; and Malen, Donald E., 4,403,762, Cl. 248-559.000.

Mamedov, Bakhtiyar M. R. O.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,403,631, Cl. 138-130.000.

Mamiya, Toshiharu: *See*—
Yamada, Tateo; Mamiya, Toshiharu; and Ikawa, Kazuo, 4,404,618, Cl. 362-17.000.

Manasevit, Harold M., to Rockwell International Corporation. Epitaxial composite and method of making. 4,404,265, Cl. 428-689.000.

Mandell, Leo: *See*—
Huttunen, Jouko; Turunen, Olli; Mandell, Leo; Eklund, Vidar; and Ekman, Kurt, 4,404,369, Cl. 536-30.000.

Manes Uso, Carmen: *See*—
Rivelles Sabater, Maria D.; Alcala Perales, Maria T.; Manes Uso, Carmen; and Calabuig Sanchis, Maria A., 4,403,637, Cl. 150-12.000.

Manesty Machines Limited: *See*—
Crossley, Jack; and Wilson, David H., 4,403,935, Cl. 425-210.000.

Manfre, Robert J.: *See*—
Cesark, Frank F.; Manfre, Robert J.; and Thomas, Daniel W., 4,403,792, Cl. 282-27.500.

Manlove, Marvin D. Modular office accessory for personal items. 4,403,700, Cl. 211-88.000.

Mann, John W.: *See*—
Cabanaw, Eldred J.; and Mann, John W., 4,404,419, Cl. 585-723.000.

Mannesmann Aktiengesellschaft: *See*—
Wassen, Johannes; and Honisch, Siegfried, 4,403,491, Cl. 72-52.000.

Mannherz, Elmer D.: *See*—
Davis, James W.; and Mannherz, Elmer D., 4,403,933, Cl. 425-129.00R.

Mansion Industries, Inc.: *See*—
Zieg, Steven A., 4,403,678, Cl. 182-153.000.

Manville Service Corporation: *See*—
Miga, Christian J.; and Mills, Millard, 4,404,155, Cl. 264-67.000.

Marathon Oil Company: *See*—
Beazley, Phillip M.; and Dormish, Frank L., 4,404,110, Cl. 252-8.55R.

Marcantonio, Angelo R., to RCA Corporation. Interrupt signal generating means for data processor. 4,404,627, Cl. 364-900.000.

March, Edward J.; and Wenger, George M., to Western Electric Company, Inc. Rosin flux filtration system. 4,403,949, Cl. 432-29.000.

Marchini, Roberto, to O.C.E.A. S.r.l. Rotary sector device turning at a variable angular speed suitable for the withdrawal and transferring of labels in automatic labelling machines. 4,404,058, Cl. 156-571.000.

Marconi Company Limited, The: *See*—
Cherry, Peter J., 4,404,622, Cl. 363-27.000.

Marconi Instruments Limited: *See*—
Smith, John L., 4,403,822, Cl. 339-108.0TP.

Marcussen, Christian: *See*—
Birch, Per; and Marcussen, Christian, 4,403,952, Cl. 432-103.000.

Margerum, Edward S.; and Hiatt, Norman A., to Dennison Manufacturing Company. Thermal imprinting of substrates. 4,404,249, Cl. 428-216.000.

Mark, Reuben, to Colgate-Palmolive Company. Combined toothbrush and gum massage device. 4,403,623, Cl. 132-84.00R.

Markiewitz, Kenneth H., to ICI Americas Inc. Acrylate production. 4,404,395, Cl. 560-209.000.

Marko Materials, Inc.: *See*—
Panchanathan, Viswanathan; Ray, Ranjan; and Giessen, Bill C., 4,404,028, Cl. 75-244.000.

Markus, Michael: *See*—
Kalu, Georgina; and Markus, Michael, 4,404,051, Cl. 149-37.000.

Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, to BASF Aktiengesellschaft. Preparation of zeolites. 4,404,175, Cl. 423-329.000.

Marschke, Charles K.: *See*—
Dolak, Lester A.; Reusser, Fritz; Castle, Thomas M.; Hannon, Betty R.; Laborde, Alice L.; and Marschke, Charles K., 4,404,190, Cl. 424-118.000.

Marsen, Horst: *See*—
Osberghaus, Rainer; Ellwanger, Hans; Marsen, Horst; and Bossek, Harald, 4,404,039, Cl. 134-3.000.

Marshall, Geoffrey B.; and Midgley, Derek, to Central Electricity Generating Board of Sudbury House. Method and apparatus for determining chemical species. 4,404,287, Cl. 436-109.000.

Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., to Microdynamics, Inc. Control system for sewing machine. 4,403,558, Cl. 112-121.110.

Martin, Hugh V.: *See*—
Hetzler, Bernard H.; and Martin, Hugh V., 4,404,252, Cl. 428-326.000.

Martin, Lawrence M.: *See*—
Warren, Eugene D.; Martin, Lawrence M.; and Kinnaman, Daniel L., 4,404,603, Cl. 360-33.100.

Marty, Frederic C. One piece key identification cover. 4,403,487, Cl. 70-408.000.

Marzocchi, Alfred; Roberts, Michael G.; Bolen, Charles E.; and Harrington, Edward L., to Owens-Corning Fiberglas Corporation. Chemically modified asphalt compositions. 4,404,316, Cl. 524-522.000.

Marzocchi, Alfred: *See*—
Bhatti, Mohinder S.; Marzocchi, Alfred; and Ritter, George W., 4,404,009, Cl. 65-1.000.

Masaki, Yoshifumi: *See*—
Kamuro, Setsufumi; and Masaki, Yoshifumi, 4,404,654, Cl. 365-103.000.

Maschinenfabrik Buckau R. Wolf AG: *See*—
Franzen, Paul, 4,403,480, Cl. 62-79.000.

Masenas, Charles J., Jr., to International Business Machines Corporation. Method and circuit for accessing an integrated semiconductor memory. 4,404,662, Cl. 365-203.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,404,310, Cl. 524-457.000.

Masler, William F., III, to B. F. Goodrich Company, The. Process of preparing copolymer of lower carboxylic acid and ester thereof. 4,404,309, Cl. 524-379.000.

Mason, Charles D.; and Tuller, Harold W., to Allied Corporation. High impact nylon composition containing copolymer esters and ionic copolymers. 4,404,325, Cl. 525-179.000.

Massachusetts General Hospital: *See*—
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,404,188, Cl. 424-105.000.

Massachusetts Institute of Technology: *See*—
Anand, Madhu; Baddour, Raymond F.; and Cohen, Robert E., 4,404,256, Cl. 428-409.000.

Masuda, Nobuhito; Nagatomo, Shigeru; and Mihara, Yuji, to Fuji Photo Film Co., Ltd. Method for immunochemical measurement of trace components. 4,404,289, Cl. 436-538.000.

Masuda, Shunichi, to Canon Kabushiki Kaisha. Copying device having plural exposure modes. 4,403,850, Cl. 355-14.00R.

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Morimoto, Yoshinori, to Ryobi, Ltd. Bail latching and releasing mechanism for spinning reel. 4,403,750, Cl. 242-84.20G.

Morisada, Norio: *See*—
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Moriya, Hisanori; Momono, Masakichi; Souma, Masahiro; and Nagano, Masami, to Hitachi, Ltd. Electromagnetic fuel injection valve. 4,403,741, Cl. 239-585.000.

Moriya, Yoshimi: *See*—
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Morris, Milton A. Fabric supporting track assembly. 4,403,642, Cl. 160-380.000.

Morrison, Herbert F.; and Miller, David A. Modular solar heating system. 4,403,600, Cl. 126-429.000.

Morrison-Knudsen Company, Inc.: *See*—
Drum, Ian; Madenburg, Richard S.; Paulsrude, Douglas M.; Sherman, Carroll H.; Turpin, Frank G.; and Wheatcroft, Gerry A., 4,404,180, Cl. 423-563.000.

Morrison, Robert S.; DeLuca, Thomas A.; and Pasqualone, Ernest, to Molded Fiber Glass Companies. Reinforced plastic sheet machine and method. 4,404,057, Cl. 156-324.000.

Mossle, Walter; Lingenhole, Bernhard; and Eibofner, Eugen, to Kaltenbach & Voigt GmbH & Co. Dental handpiece having own electrical light source. 4,403,957, Cl. 433-29.000.

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Motorola, Inc.: *See*—
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Motorola, Inc.: *See*—
Genrich, Thad J.; and Bickley, Robert H., 4,404,531, Cl. 331-64.000.
Richardson, Roy A., 4,404,563, Cl. 343-100.05A.
Weber, Howard F., 4,403,591, Cl. 123-609.000.

Mountz, Elton; Whiteman, Paul; Higginson, Roy C.; and Hacker, Marlin W., to Morgan Trailer Mfg. Co. Truck or trailer body construction. 4,403,804, Cl. 296-183.000.

Moyer, Donald L., to R. E. Wright Associates, Inc. Automatic well skimmer. 4,404,093, Cl. 210-138.000.

Muchel, Franz: *See*—
Lang, Walter H.; and Muchel, Franz, 4,403,841, Cl. 351-215.000.

Mueller, Peter; Schibli, Eugen; Scheidweiler, Andreas; and Muggli, Jurg, to Cerberus AG. Method for transmitting measuring values in a fire alarm system and apparatus for the performance of the aforesaid method. 4,404,548, Cl. 340-505.000.

Mueller, Robert L.; and Cherney, Jerome A., to James River-Dixie/-Northern, Inc. Microwave package with vent. 4,404,241, Cl. 428-35.000.

Muench, Volker; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Preparation of electrically conductive polymeric systems. 4,404,126, Cl. 252-512.000.

Muggli, Jurg: *See*—
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Mulder, Willem; van Rooyen, Gerrit; and Zwarts, Johan M. C., to Hollandse Signaalapparaten B.V. Radar system. 4,404,561, Cl. 343-16.00R.

Muller, Alfred: *See*—
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Muller, Hans; and Guazzone, Bruno, to Chemap AG. Filter apparatus and a method of cleaning filter elements thereof. 4,404,106, Cl. 210-772.000.

Muller, Hans: *See*—
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Muller, Michael: *See*—
Gibas, Christoph; and Muller, Michael, 4,403,753, Cl. 242-125.200.

Muller, Rolf W., to Gesellschaft fur Schwerionenforschung mbH. High frequency resonator. 4,404,495, Cl. 315-5.410.

Munsterman, Ronald S.; and Bowers, Homer C., to Westinghouse Electric Corp. Strip winding machine and method. 4,403,489, Cl. 72-16.000.

Murakami, Junzo, to Tokyo Shibaura Denki Kabushiki Kaisha. Ghost signal cancelling apparatus. 4,404,600, Cl. 358-905.000.

Murakami, Mitsuru: *See*—
Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, 4,403,954, Cl. 432-124.000.

Muralidhara, Ranya: *See*—
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Ragas, Frank J.; Minnis, Ralph L.; Murphy, Edward J.; and Vargo, Steve J., 4,404,308, Cl. 524-379.000.

Murphy, George W. Photoelectrodialytic cell. 4,404,081, Cl. 204-253.000.

Murray, Wayne A., to Edsyn, Inc. Universal temperature control circuits. 4,404,462, Cl. 219-497.000.

Muscariello, Giuseppe: *See*—
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Mussiger, Klaus, to Herbert Kannegiesser GmbH & Co. Apparatus for drying and smoothing articles of clothing. 4,403,425, Cl. 34-162.000.

N.C.A. Co., Ltd.: *See*—
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N.J. Phillips Pty. Limited: *See*—
Lodge, Robert H.; Phillips, Ian R.; and Reynolds, Mervyn F., 4,403,610, Cl. 604-61.000.

Naaktgeboren, Adrianus, to Sperry Corporation. Overload protection device for baler feeder mechanism. 4,403,544, Cl. 100-189.000.

Naarden International N.V.: *See*—
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Naarmann, Herbert; Hambrecht, Juergen; and Rieber, Norbert, to BASF Aktiengesellschaft. Preparation of polyphenylene ethers. 4,404,359, Cl. 528-216.000.

Naarmann, Herbert: *See*—
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Nabisco Brands, Inc.: *See*—
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Nagano, Masami: *See*—
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Nagano, Mitsuo, to Taiyo Shokai Co., Ltd. Method and apparatus for automatically controlling travel of two plastics film strips as a bag material or the like. 4,403,718, Cl. 226-27.000.

Nagano, Noriaki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, 4,404,373, Cl. 544-21.000.

Nagano, Yoshinobu: *See*—
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Nagasaku, Eiichi; Yasunaga, Masao; and Kato, Kimihiro, to Nippondenso Co., Ltd. Rotary compressor. 4,403,929, Cl. 418-82.000.

Nagashita, Mitsuyoshi: *See*—
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Nagatomo, Shigeru: *See*—
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Nagayama, Yasuji; and Taniguchi, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory circuit. 4,404,661, Cl. 365-203.000.

Nagy, Lajos: *See*—
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Naiff, Kenneth L., to General Instrument Corporation. Data sense apparatus for use in multi-threshold read only memory. 4,404,655, Cl. 365-104.000.

Naito, Masayoshi: *See*—
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Nakagawa, Akira, to Nifco, Inc. Tape reel. 4,403,749, Cl. 242-71.800.

Nakagawa, Katsumi; and Fukada, Tadaji, to Canon Kabushiki Kaisha. Film forming process utilizing discharge. 4,404,076, Cl. 204-164.000.

Nakahama, Kazushi, to Tokyo Aircraft Instrument Co. Ltd. Servo-type capsule-equipped instrument. 4,403,512, Cl. 73-701.000.

Nakahashi, Ken-ichi, to Olympus Optical Co., Ltd. Objective for endoscopes. 4,403,837, Cl. 350-465.000.

Nakajima, Fumio, to Citizen Watch Co., Ltd. Electronic timepiece. 4,404,510, Cl. 318-696.000.

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Nakamura, Akira: *See*—
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Nakamura, Toshiomi; Okamura, Masakazu; Moriguchi, Yoichiro; and Hayase, Tamiki, to Nippon Paint Co., Ltd. Polyisocyanate crosslinked polymers containing cellulosic component. 4,404,347, Cl. 527-300.000.

Nakamura, Yoshiaki: *See*—
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Nakanishi, Michio: *See*—
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Nakanishi, Tousaku; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Analog-to-digital converter of the dual slope type. 4,404,545, Cl. 340-347.0NT.

Nakano, Masayoshi: *See*—
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Nakao, Hiroaki: *See*—
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Nakatsukasa, Walter M., to Eli Lilly and Company. Process for enzyme inhibitor. 4,404,282, Cl. 435-122.000.

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Nakazyo, Kiyoshi: *See*—
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Namai, Akihiro, to Canon Kabushiki Kaisha. Malfunction preventing device for camera. 4,403,844, Cl. 354-234.000.

National Petro Chemicals Corporation: *See*—
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National Research Development Corporation: *See*—
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Jahani, Hooshang, 4,404,080, Cl. 204-224.00R.
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Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. Process for making composite yarn of continuous filaments and staple fibers. 4,403,470, Cl. 57-5.000.

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Newell, William C., to I-Tron, Inc. Envelope. 4,403,696, Cl. 206-623.000.

Nichols, Richard A., to Rockwell International Corporation. Differential absolute equalization measurement circuit. 4,404,520, Cl. 324-82.000.

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Niikawa, Ryo; and Wakou, Susumu, to Honda Giken Kogyo Kabushiki Kaisha. Welding apparatus for motorcar body. 4,404,451, Cl. 219-80.000.
Nijjar, Amrik S., to Wood George & Company. Inside blowout preventer. 4,403,628, Cl. 137-515.500.
Nikles, Walter G., Jr. Garment display and storage unit. 4,403,703, Cl. 211-193.000.
Nikolich, Milovan, to Signode Corporation. Combustion gas powered fastener driving tool. 4,403,722, Cl. 227-8.000.
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Honjo, Kazumi, 4,404,438, Cl. 200-61.540.
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Nishida, Koji; and Kawai, Taneichi, to Aisin Seiki Kabushiki Kaisha. Control method for stopping DC motor at predetermined position. 4,404,508, Cl. 318-611.000.
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Norton, Lyle K.: *See*—
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Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozseki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.
Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, 4,404,604, Cl. 360-71.000.
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Pirozzi, Mario: *See*—
Maccone, Sergio; Dal Moro, Anacleto; Pirozzi, Mario; and Capizzi, Amedeo, 4,404,185, Cl. 424-84.000.
Piry, Pierre: *See*—
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Pistorius, Rudolf: *See*—
Cramer, Jurgen; Pistorius, Rudolf; and Mitzlaff, Michael, 4,404,082, Cl. 204-290.00R.
Piteo, Michael J., to R. E. Phelon Company, Incorporated. Electronic switching for solid state ignition. 4,403,593, Cl. 123-651.000.
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with methyl-thio-2-methyl-2-pentenoate. 4,404,184, Cl. 424-49.000.
Pittsburgh-Des Moines Corporation: *See*—
Hills, Richard E., 4,403,460, Cl. 52-745.000.
Plastics Engineering Company: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,404,139, Cl. 548-423.000.
Plesch, Franz: *See*—
Waldmann, Gunter; and Plesch, Franz, 4,403,948, Cl. 432-1.000.
Ploeg, Johan F.; and Oden, Arlo L., to Chevron Research Company. Permanent thermal packer. 4,403,656, Cl. 166-179.000.
Plomp, Roeland: *See*—
van der Weerdt, Antonius J. A.; Plomp, Roeland; and Apeldoorn, Willem, 4,404,127, Cl. 252-522.00R.
Ploss, Hartmut; and Lehne, Jurgen, to Norddeutsche Affinerie AG. Process for producing cupric hydroxide. 4,404,169, Cl. 423-35.000.
Poetschke, Leonard E., to Scotia Recovery Systems Limited. Apparatus for manufacturing fluid coal-oil-water fuel mixture. 4,403,997, Cl. 44-2.000.
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Idelson, Elbert M.; and King, Patrick F., 4,404,136, Cl. 260-147.000.
Pollacco, William F. Motor oil change kit. 4,403,692, Cl. 206-223.000.
Pollard, David D.; and Krajci, Gary E., to Westinghouse Electric Corp. Mounting arrangement for disc mounted semiconductor devices. 4,404,582, Cl. 357-79.000.
Pollock, Lyle W., to Phillips Petroleum Company. Iron-containing refractory balls for retorting oil shale. 4,404,152, Cl. 264-15.000.
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Polysar International S.A.: *See*—
Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., 4,404,416, Cl. 585-671.000.
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Koski, Unto K.; Khalil, Hamdy; and Cassola, Adrian, 4,404,300, Cl. 524-91.000.
Pomper, Seymour; and La Baw, Glenn D., to Nabisco Brands, Inc. Bread mix and process. 4,404,227, Cl. 426-19.000.
Porter, Randall A.: *See*—
Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., 4,404,087, Cl. 208-48.0AA.
Ports, Kenneth A., to Harris Corporation. Mesa bipolar memory cell and method of fabrication. 4,404,658, Cl. 365-154.000.
Possell, Clarence R. Bladeless pump and method of using same. 4,403,911, Cl. 415-90.000.
Post Office: *See*—
Slight, John R., 4,403,551, Cl. 104-138.00G.
Potter, Charles W., to J. H. Fenner & Co. Ltd. Annular fluid seals. 4,403,780, Cl. 277-88.000.
Powers, John K.: *See*—
Bryan, David A.; and Powers, John K., 4,403,827, Cl. 350-162.170.
PPG Industries, Inc.: *See*—
DeLue, Norman R., 4,404,398, Cl. 562-598.000.
Grunewalder, John F., 4,404,239, Cl. 427-393.000.
Reese, Walter J.; and Walker, Jimmy D., 4,403,744, Cl. 242-18.00G.
Sharp, Thomas K. R., 4,403,550, Cl. 101-452.000.
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Pradel, Gunter; and Quaschning, Ulrich, to Sartorius GmbH. Filtration apparatus for flat filter plates cut to size. 4,404,102, Cl. 210-247.000.
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Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Preis, Hans M., 4,404,187, Cl. 424-101.000.
Presby, Herman M., to Bell Telephone Laboratories, Incorporated. Ultraviolet radiation detector. 4,403,826, Cl. 350-96.300.
Primich, Theodore. Energy saving heat recycling system. 4,403,732, Cl. 237-50.000.
Pritchard, Dalton H., to RCA Corporation. Signal processing apparatus effecting asymmetrical vertical peaking. 4,404,584, Cl. 358-31.000.
Procter & Gamble Company, The: *See*—
Anderson, Barry J., 4,404,128, Cl. 252-546.000.
Persson, Louis T.; and Riemersma, Coenraad E., 4,404,052, Cl. 156-73.100.
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Pryor, Timothy R., to Diffracto Ltd. Apparatus for determining dimensions. 4,403,860, Cl. 356-375.000.
Pucciarello, Frank, to Sangamo Weston, Inc. Display connection scheme for modular analog/digital instrument. 4,404,522, Cl. 324-114.000.
Pyykkonen, Pentti. Auxiliary device for oil burner for mixing water and oil for combustion. 4,403,944, Cl. 431-90.000.
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Pradel, Gunter; and Quaschning, Ulrich, 4,404,102, Cl. 210-247.000.
Quigley, Thomas J., to Continental-Wirt Electronics Corporation. Molded snap-in switch having movable contact blade which uses compound motion. 4,404,437, Cl. 200-16.00C.
Quinn, Jeffrey J.: *See*—
Jenkins, Robert D., 4,403,434, Cl. 40-152.000.
R.B.L. Riello Bruciatori Legnago S.p.A.: *See*—
Stella, Antonio; and Canova, Giuseppe, 4,403,943, Cl. 431-31.000.
R. E. Phelon Company, Incorporated: *See*—
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R. E. Wright Associates, Inc.: *See*—
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R. J. Thomas Manufacturing Co.: *See*—
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Radiation Systems Incorporated: *See*—
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Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, 4,403,803, Cl. 296-179.000.
Ragard, Phillip A.: *See*—
Dean, Weibley J.; Merithew, David L.; and Ragard, Phillip A., 4,403,723, Cl. 227-76.000.
Ragas, Frank J.; Minnis, Ralph L.; Murphy, Edward J.; and Vargo, Steve J., to DeSoto, Inc. Low temperature curing thermosetting coatings for solvent-sensitive moldings. 4,404,308, Cl. 524-379.000.
Ragland, Ewing, Jr. Fishing line knot tying tool. 4,403,797, Cl. 289-17.000.
Rainbow, Arnold, to Fisons Limited. Plant growth medium. 4,404,013, Cl. 71-24.000.
Rainin, Edgar A. Intraocular lens having a fixation mechanism. 4,403,354, Cl. 3-13.000.
Raman, Hariharan: *See*—
Menon, Kuruvakkat K. G.; Raman, Hariharan; Sarma, Vadali S.; and Subba, Bookinkere C., 4,404,015, Cl. 71-77.000.
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Ron, Eliora Z., 4,404,186, Cl. 424-92.000.
Ramsey, Rickey H. Stabilizing drill collar. 4,403,668, Cl. 175-325.000.
Ramtek Corporation: *See*—
Payne, Errol G.; McGregor, Charles D.; and Uyeda, Tim M., 4,403,874, Cl. 400-124.000.
Ramun, John: *See*—
Ramun, Michael; and Ramun, John, 4,403,431, Cl. 37-117.500.
Ramun, Michael; and Ramun, John. Self-contained material handling and shearing attachment for a backhoe. 4,403,431, Cl. 37-117.500.
Randam Electronics, Inc.: *See*—
Stevens, William M.; and Timperman, Eugene L., 4,403,687, Cl. 198-472.000.
Rando Machine Corporation: *See*—
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Rankel, Lillian A., to Mobil Oil Corporation. Treatment of shale oils. 4,404,091, Cl. 208-131.000.
Ransburg Corporation: *See*—
Scharfenberger, James A., 4,403,736, Cl. 239-112.000.
Ransom, Leslie: *See*—
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Ransom, Stephen A.; and Stickel, Tedd K., to Sperry Corporation. High speed-low power gallium arsenide basic logic circuit. 4,404,480, Cl. 307-475.000.
Rapp, Gunther, deceased: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased; and Thomas, Erwin, 4,404,176, Cl. 423-387.000.
Rapp, Heinz, to AGFA-Gevaert AG. Arrangement for cleaning band-like data carriers. 4,403,370, Cl. 15-308.000.

Rapp, Ruth E., legal representative: *See—*
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased; and Thomas, Erwin, 4,404,176, Cl. 423-387.000.

Rarick, Kimber W., to Coburn Optical Industries, Inc. Digital gauge for measuring sagittal depth and thickness of lens, and related system and method. 4,403,420, Cl. 33-174.00A.

Rasmussen, Ole-Bendt; and Jensen, Borge, to Rasmussen, Ole-Bendt. Coextrusion die. 4,403,934, Cl. 425-192.00R.

Rasovich, Ivan, to Rasovich, Ivan. Quick freezing system. 4,403,479, Cl. 62-63.000.

Rath, Klaus: *See—*
Jabs, Gert; Dahm, Manfred; Haus, Artur; Nehen, Ulrich; Rath, Klaus; and Weimann, Norbert, 4,404,251, Cl. 428-320.600.

Rattunde, Manfred, to P.I.V. Antrieb Werner Reimers GmbH & Co. KG. Cone-pulley belt-type transmission. 4,403,975, Cl. 474-18.000.

Ravey, Manny: *See—*
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Ravinet, Pierre: *See—*
Facoetti, Hugues; Petit, Patrick; Menoret, Philippe; Micheron, Francois; and Ravinet, Pierre, 4,403,382, Cl. 29-25.350.

Ray, Ranjan: *See—*
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Raybaud, Alain M. M.: *See—*
Laffitte, Denis R. G.; Louis, Guy H.; and Raybaud, Alain M. M., 4,403,917, Cl. 416-96.00A.

Rayborn, Jerry R.: *See—*
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,404,107, Cl. 252-8.50M.

Rayl, Richard L.: *See—*
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Raymoure, Russell A.; Bechtel, Richard P., Jr.; Carson, Ray; and Don Carlos, Alva G., to Hallmark Cards, Inc. Heat-shrinkable film wrapped packaging. 4,403,695, Cl. 206-497.000.

Raytheon Company: *See—*
Kits van Heyningen, Arent H., 4,404,665, Cl. 367-100.000.

Raz, Omri, to Eshet Eilon. Apparatus for weighing continuously-moving articles particularly useful for grading produce. 4,403,669, Cl. 177-145.000.

RCA Corporation: *See—*
Cave, Eric F.; and Cowden, James J., 4,403,453, Cl. 51-124.00R.
Deyer, Craig E., 4,404,515, Cl. 324-54.000.
Dingwall, Andrew G. F., 4,404,474, Cl. 307-260.000.
Forberger, Steven C., 4,403,547, Cl. 101-170.000.
Griffis, Patrick D., 4,404,429, Cl. 179-1.0VL.
Levine, Peter A., 4,404,587, Cl. 358-44.000.
Lin, Peter T., 4,403,369, Cl. 15-304.000.
Marcantonio, Angelo R., 4,404,627, Cl. 364-900.000.
Miller, Arthur, 4,404,465, Cl. 250-203.00R.
Miller, Michael E., 4,404,669, Cl. 369-170.000.
Pritchard, Dalton H., 4,404,584, Cl. 358-31.000.
Shanley, Robert L., II; and Harwood, Leopold A., 4,404,593, Cl. 358-168.000.
Tarng, Ming L.; and Hicinbothem, Walter A., Jr., 4,404,235, Cl. 427-89.000.
Taylor, Byron K., 4,404,670, Cl. 369-170.000.
Thomas, Caleb H., Jr., 4,404,542, Cl. 340-146.200.

Reckitt & Colman Products Limited: *See—*
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Recognition Equipment Incorporated: *See—*
Nunley, Leonard J.; Simpson, Willis D.; and Reid, William J., 4,404,649, Cl. 364-900.000.

Redeker, Detmar: *See—*
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Reed, Larry E.; Porter, Randall A.; Farha, Floyd E., Jr.; and Guillory, Jack P., to Phillips Petroleum Company. Antifoulants for thermal cracking processes. 4,404,087, Cl. 208-48.0AA.

Reeder, William M. Adjustable, quick installation, window covering device. 4,403,641, Cl. 160-263.000.

Reese, Walter J.; and Walker, Jimmy D., to PPG Industries, Inc. Method and apparatus for controlling strand tension during winding. 4,403,744, Cl. 242-18.00G.

Reeves Bros., Inc.: *See—*
Terpay, John M., 4,404,243, Cl. 428-62.000.

Reichel, Artur, to Ernst Leitz Wetzlar GmbH. Comparator macroscope or microscope. 4,403,839, Cl. 350-514.000.

Reichert, Harry J., Jr., to General Instrument Corporation. Fault detection system as for locating faulty connections in a cable television system. 4,404,514, Cl. 324-52.000.

Reichman, James M.; and Kelley, Douglas P., to Electric Power Research Institute, Inc. Cable following apparatus utilizing a releasable cable gripping mechanism. 4,403,667, Cl. 175-230.000.

Reid, William J.: *See—*
Nunley, Leonard J.; Simpson, Willis D.; and Reid, William J., 4,404,649, Cl. 364-900.000.

Reilich, David G.: *See—*
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Reimar, Wolfgang, to Dr. Johannes Heidenhain GmbH. Electrical contact for position measuring instrument. 4,403,823, Cl. 339-126.00R.

Reiner, Josef: *See—*
Aulhorn, Elfriede; Kocher, Jakob; and Reiner, Josef, 4,403,842, Cl. 351-237.000.

Reinhard, Peter: *See—*
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Rekers, Louis J.: *See—*
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Rementer, Stephen W.: *See—*
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Remond, Georges: *See—*
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Rempfler, Hermann: *See—*
Schurter, Rolf; Clauson-Kaas, Niels; and Rempfler, Hermann, 4,404,020, Cl. 71-94.000.

Renner, G. Frederick, to Battelle Memorial Institute. Rotative power and signal coupling. 4,404,559, Cl. 340-870.280.

Rentler, Robert J.; and Sproul, David D., to Air Products and Chemicals, Inc. Combined cascade and multicomponent refrigeration method with refrigerant intercooling. 4,404,008, Cl. 62-11.000.

REPA Feinstanzwerk G.m.b.H.: *See—*
Fohl, Artur, 4,403,752, Cl. 242-107.200.

Repplinger, Thomas J., to Otto Engineering, Inc. Method and apparatus for controlling flow of work materials. 4,403,764, Cl. 251-5.000.

Reusser, Fritz: *See—*
Dolak, Lester A.; Reusser, Fritz; Castle, Thomas M.; Hannon, Betty R.; Laborde, Alice L.; and Marschke, Charles K., 4,404,190, Cl. 424-118.000.

Reuters Limited: *See—*
Howse, Peter; Cookson, Dennis; and Lane, Stephen P., 4,404,551, Cl. 340-711.000.

Reynolds, Mervyn F.: *See—*
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Rhodes, Smith A., to Communications Satellite Corporation. Method and apparatus for weighted majority decoding of FEC codes using soft detection. 4,404,674, Cl. 371-43.000.

Rhone-Poulenc Industries: *See—*
Bartissol, Alain; Boutin, Jean; and Wachowski, Francois, 4,404,073, Cl. 204-159.230.
Leveque, Alain; and Triollier, Michel, 4,404,174, Cl. 423-112.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Fau, Alain; and Nicou, Parasko, 4,404,348, Cl. 528-15.000.

Ricci, Louis N.: *See—*
Maier, Alfred E.; and Ricci, Louis N., 4,404,446, Cl. 200-320.000.

Rich, Donald S., to Thomas & Betts Corporation. Connector for terminating undercarpet signal transmission cable. 4,403,820, Cl. 339-97.00R.

Rich, Donald S., to Thomas & Betts Corporation. Cable assembly for undercarpet signal transmission. 4,404,425, Cl. 174-107.000.

Richards, Edwin H., to L & H Designs Limited. Fastening apparatus and control systems therefor. 4,403,409, Cl. 29-798.000.

Richardson, Kenneth, to Pfizer Inc. Antifungal 1,3-bis-triazolyl-2-propanol derivative. 4,404,216, Cl. 424-269.000.

Richardson, Roy A., to Motorola, Inc. System of directional antennas with means for reducing flutter. 4,404,563, Cl. 343-100.0SA.

Richmond, Moscow K. Gate-opening and closing apparatus and method. 4,403,449, Cl. 49-340.000.

Richter, Dag: *See—*
Mercier, Olivier; Richter, Dag; and Schroder, Gunther, 4,404,025, Cl. 148-11.50F.

Richter, Ekkehard: *See—*
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Ricoh Company, Ltd.: *See—*
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Yanagawa, Nobuyuki, 4,403,851, Cl. 355-14.00R.

Ricotti, Giulia C. B. A.; and Zeijlemaker, Willem P., to Stichting Vrienden van de Stichting Dr. Karl Landsteiner. Method of culturing hybridomas. 4,404,279, Cl. 435-68.000.

Riddle, Travis: *See—*
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufris, Robert, 4,404,295, Cl. 521-172.000.

Rieber, Norbert: *See—*
Naarmann, Herbert; Hambrecht, Juergen; and Rieber, Norbert, 4,404,359, Cl. 528-216.000.

Riemersma, Coenraad E.: *See—*
Persson, Louis T.; and Riemersma, Coenraad E., 4,404,052, Cl. 156-73.100.

Riemscheid, Helmut, to Uni-Cardan Aktiengesellschaft. Sealing assembly for universal joint. 4,403,781, Cl. 277-212.0FB.

Riepl, Martin: *See—*
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Rieter Machine Works Limited: *See—*
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Riker Laboratories, Inc.: *See—*
Stern, Richard M., 4,404,207, Cl. 424-258.000.

Rinnai Kabushiki Kaisha: *See—*
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Rischmuller, Klaus, to Thomson-CSF. Process for controlling a darlington circuit and a low-loss darlington circuit. 4,404,478, Cl. 307-315.000.

Rise, Leif, to Garrett Corporation, The. Turbocharger control actuator. 4,403,538, Cl. 92-94.000.

Ritter, George W.: *See—*
Bhatti, Mohinder S.; Marzocchi, Alfred; and Ritter, George W., 4,404,009, Cl. 65-1.000.

Rivelles Sabater, Maria D.; Alcala Perales, Maria T.; Manes Uso, Carmen; and Calabuig Sanchis, Maria A. Reinforced flexible container. 4,403,637, Cl. 150-12.000.

RM Industrial Products Company, Inc.: *See—*
Ledbetter, Stephen G.; Singleton, Michael P.; Johns, Thomas J.; and Fabian, James L., 4,403,796, Cl. 285-223.000.

Robbins, Roland W., to United States of America, Navy. Expander stroke delay mechanism for split stirling cryogenic cooler. 4,403,478, Cl. 62-6.000.

Robert Bosch GmbH: *See—*
Eblen, Ewald; Hofmann, Karl; and Kopse, Odon, 4,403,740, Cl. 239-533.400.
Eheim, Franz, 4,403,583, Cl. 123-387.000.
Fritz, Adolf R., 4,403,592, Cl. 123-609.000.
Lauterbach, Heinz, 4,403,506, Cl. 73-204.000.
Mohl, Helmut; Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,403,527, Cl. 74-851.000.

Roberts, Michael G.: *See—*
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Roberts, Michael L.: *See—*
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Robertson, Alexander J.: *See—*
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Robertson, Roger L.: *See—*
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Robinson, John E., to International Computers Limited. Manufacture of printed circuit boards. 4,403,410, Cl. 29-830.000.

Robinson, John W.: *See—*
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Robinson, Ralph C., to Olympian Stone Company. Method of making a building panel. 4,404,158, Cl. 264-263.000.

Rockland, Ronald H.: *See—*
Engle, William R.; Moore, E. Neil, Jr.; Spear, Joseph F., Jr.; and Rockland, Ronald H., 4,403,614, Cl. 128-419.00D.

Rockwell International Corporation: *See—*
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Grande, Johannes; and Brown, James H., 4,404,677, Cl. 371-69.000.
Manasevit, Harold M., 4,404,265, Cl. 428-689.000.
Nichols, Richard A., 4,404,520, Cl. 324-82.000.
Talbot, Terence R., 4,403,495, Cl. 72-383.000.
Tam, Matthias L.; and Custode, Frank Z., 4,404,581, Cl. 357-59.000.

Rodew International: *See—*
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Rodrigues, Allan B. J.: *See—*
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Roeder, George K. Seal gland improvements for hydraulically actuated downhole pumps. 4,403,922, Cl. 417-358.000.

Rogachevsky, George. Rotary vane internal combustion engine. 4,403,581, Cl. 123-239.000.

Rogers, Noel A., to Terra Corporation. Frequency control system for radio apparatus employing filter amplifier operated at harmonic of frequency of synthesized signal source. 4,404,685, Cl. 455-76.000.

Rogo, Casimir; Lenz, Herman N.; and Holbrook, Michael, to Teledyne Industries, Inc. Variable geometry device for turbomachinery. 4,403,914, Cl. 415-165.000.

Rohm and Haas Company: *See—*
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Rokujio, Masaharu; Ogasawara, Takaaki; and Usui, Mitunori, to Kobe Steel, Ltd. Welding core wire supply device. 4,404,457, Cl. 219-137.200.

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Weaver, Colin R., 4,403,735, Cl. 239-1.000.

Romanski, Eric R.; and Josef, Michael J., to Albany International Corp. Corrugator belt with high air permeability. 4,403,632, Cl. 139-383.00A.

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Schroeder, Robert W., 4,403,364, Cl. 15-4.000.

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Rosemount Inc.: *See—*
DeLeo, Richard V., 4,403,872, Cl. 374-138.000.

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Rosenthal, Robert D., to Trebor Industries, Inc. Apparatus for near infrared quantitative analysis with temperature variation correction. 4,404,642, Cl. 364-571.000.

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Boothe, James H.; and Ross, Adma S., 4,404,374, Cl. 544-26.000.
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Coynel, Daniel; and Roussigne, Maurice, 4,404,443, Cl. 200-147.00A.

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Channing, Christopher P.; and Rovinsky, William Z., 4,404,613, Cl. 361-104.000.

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Zybailo, Valentin P.; Kniga, Anatoly N.; Kosyan, Ljudmila E.; Rudenko, Valentin P.; and Poltaev, Sergei A., 4,404,547, Cl. 340-365.00R.

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Cornils, Boy; Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,404,410, Cl. 568-858.000.

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Runco, Virgil S. Knock down projection television cabinet. 4,403,815, Cl. 312-7.200.

Ruthven, William A. Hydrolic fluid-lubricated piston-combustion engine. 4,403,474, Cl. 60-396.000.

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Bach, Erik; and Ryaa, Jan, 4,403,733, Cl. 238-10.00E.

Ryan, John O., to Ampex Corporation. Circuit for minimizing edge hooking in television camera pickup tubes. 4,404,499, Cl. 315-371.000.

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Morimoto, Yoshinori, 4,403,750, Cl. 242-84.20G.

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Beilmann, Gunter; Cervini, Celeste; and Sachetto, Jean-Pierre, 4,404,371, Cl. 536-98.000.

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D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,404,139, Cl. 548-423.000.

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Fukushima, Takeshi; Sakagami, Kiyoshi; and Ikegami, Yoshihiro, 4,403,863, Cl. 366-8.000.

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Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, 4,404,604, Cl. 360-71.000.

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Sakakibara, Takaaki; and Kanno, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Three-phase gas insulated bus. 4,404,423, Cl. 174-27.000.

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Sakoda, Akinori: *See—*
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Sakurai, Junji, to Fujitsu Limited. Process for producing a semiconductor device. 4,403,400, Cl. 29-576.00B.

Sammarco, Peter, to International Harvester Co. Adjustable drawbar. 4,403,670, Cl. 180-14.00R.

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Arikawa, Hiroo, 4,404,537, Cl. 337-232.000.

Sanders, James B.; and Kobashigawa, Don. Disposable buccal hygenic device. 4,403,625, Cl. 132-91.000.

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Lamborn, Calvin R., 4,403,445, Cl. 47-58.000.
Matejcek, Milan; Theohar, Carl; and Kleinlogel, Horst, 4,404,226, Cl. 424-326.000.

Sanford, Lyell G.; and Ransom, Leslie, to General Signal Corporation. Printing mechanism. 4,403,546, Cl. 101-79.000.

Sangamo Weston, Inc.: *See—*
Pucciarello, Frank, 4,404,522, Cl. 324-114.000.

Sankei Giken Kogyo Kabushiki Kaisha: *See—*
Okada, Tomoyuki; Fukuda, Masuo; and Sugihara, Hideki, 4,404,042, Cl. 148-6.200.

Sankin Industry Co., Ltd.: *See—*
Tsunekawa, Masayoshi; Miyoshi, Nobuyoshi; and Komura, Tamotsu, 4,404,150, Cl. 260-927.00R.

Sano, Sakae: *See—*
Ohoka, Shinkichi; and Sano, Sakae, 4,403,891, Cl. 405-264.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Iwai, Tomio; and Tobinaga, Motoi, 4,403,578, Cl. 123-73.0AD.

Sanyo Electric Co., Ltd.: *See—*
Yasuda, Isao; Koyama, Kazuaki; and Kawai, Yoshihiko, 4,404,608, Cl. 360-126.000.

Sapelak, Ronald, to Clark Equipment Company. Means for converting a grapple skidder to a cable skidder. 4,403,902, Cl. 414-569.000.

Sargent, Donald J., to E/M Lubricants, Inc. Metal forming lubricant and method of use thereof. 4,403,490, Cl. 72-42.000.

Sarma, Vadali S.: *See—*
Menon, Kuruvakkat K. G.; Raman, Hariharan; Sarma, Vadali S.; and Subba, Bookinkere C., 4,404,015, Cl. 71-77.000.

Sarno, Nicola, to General Signal Corporation. Receptacle for support of a melt containing crucible. 4,403,955, Cl. 432-158.000.

Sartorius GmbH: *See—*
Pradel, Gunter; and Quaschning, Ulrich, 4,404,102, Cl. 210-247.000.

Sato, Hideo: *See—*
Yamada, Kazuji; Nishihara, Motohisa; Sato, Hideo; Suzuki, Seiko; and Kobayashi, Ryoichi, 4,404,539, Cl. 338-3.000.

Sato, Toyohiro: *See—*
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; and Sato, Toyohiro, 4,404,533, Cl. 335-131.000.

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Yamamoto, Hajime; and Sato, Yoshihiko, 4,404,524, Cl. 324-459.000.

Satoh, Hiroaki; Tabata, Yasuyuki; Gomikawa, Kouichi; and Hiruta, Masaru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Tower for drying gaseous chlorine. 4,404,171, Cl. 422-241.000.

Saytech, Inc.: *See—*
Barda, Henry J., 4,404,361, Cl. 528-342.000.

Scaffidi, Cono T. Heating element for an open fireplace. 4,403,598, Cl. 126-121.000.

Schaaf, Thomas K.: *See—*
Johnson, Michael R.; Schaaf, Thomas K.; and Hess, Hans-Jurgen E., 4,404,372, Cl. 542-429.000.

Schaefer, James R., to United States of America, Air Force. Roller bearing cage design. 4,403,813, Cl. 308-207.00R.

Schaeffer, Hans-Joachim: *See—*
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,404,101, Cl. 210-232.000.

Schaeflern, Henry; and Szostak, Jan, to Singer Company, The. Presser bar spring-connection. 4,403,561, Cl. 112-237.000.

Schallenberger, Wolfgang: *See—*
Heider, Manfred; Hofschneider, Josef; Schallenberger, Wolfgang; Nodes, Franz; and Kempe, Eberhard, 4,404,284, Cl. 435-291.000.

Schapel, Dietmar, to Bayer Aktiengesellschaft. Gel compositions with depot action based on a polyurethane matrix and relatively high molecular weight polyols and containing active ingredients, and a process for their preparation. 4,404,296, Cl. 523-105.000.

Scharfenberger, James A., to Ransburg Corporation. Uncontaminated purge solvent recovery system. 4,403,736, Cl. 239-112.000.

Scharfenbergkupplung GmbH: *See—*
Ernst, Dieter; Forster, Hilmar; Gunther, Wilhelm; and Vahldick, Ernst, 4,403,705, Cl. 213-1.300.

Schaub, Robert E.; Upeslacis, Janis; and Bernstein, Seymour, to American Cyanamid Company. Poly cation salts of monohexosethio (or oxy) alkyl diamides. 4,404,195, Cl. 424-180.000.

Schedlitzki, Dietmar: *See—*
Fock, Jurgen; and Schedlitzki, Dietmar, 4,404,324, Cl. 525-123.000.

Scheidweiler, Andreas: *See—*
Mueller, Peter; Schibli, Eugen; Scheidweiler, Andreas; and Muggli, Jurg, 4,404,548, Cl. 340-505.000.

Schelling, Edward C.: *See—*
Caldwell, David L.; and Schelling, Edward C., 4,403,895, Cl. 411-378.000.

Scherbing, Frank J., to Fort Lock Corporation. Slide fastener bag lock. 4,403,485, Cl. 70-68.000.

Schering Aktiengesellschaft: *See—*
Annen, Klaus; Laurent, Henry; and Hofmeister, Helmut, 4,404,141, Cl. 260-397.300.

Scherson, Isaac: *See—*
Rahman, Smil; and Scherson, Isaac, 4,404,653, Cl. 365-49.000.

Schertz, Burtron D.; and Glandon, Jerry L., to General Motors Corporation. Bridge audio amplifier including low level fade control. 4,404,527, Cl. 330-84.000.

Scherubel, Gary A.; and Thorne, Michael A., to Petrolite Corporation. Hydrocarbon foams as well stimulants. 4,404,112, Cl. 252-8.55B.

Schibli, Eugen: *See—*
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Schifferly, Richard E. Tire mounting combination tool. 4,403,640, Cl. 157-1.300.

Schilffarth, Karlchristian: *See—*
Kohler, Robert; Schilffarth, Karlchristian; Kober, Heinrich; and Nippe, Burkhard, 4,404,253, Cl. 428-327.000.

Schiltz, Ronald M.; and Corlett, Alan H., to Crepaco, Inc. Plate heat exchanger. 4,403,652, Cl. 165-167.000.

Schirmann, Peter J.: *See—*
Parekh, Girish G.; Blank, Werner J.; and Schirmann, Peter J., 4,404,332, Cl. 525-428.000.

Schlimper, Hans-Ulrich: *See—*
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,404,175, Cl. 423-329.000.

Schlumberger Technology Corporation: *See—*
Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., 4,404,467, Cl. 250-270.000.
Upchurch, James M., 4,403,659, Cl. 166-374.000.

Schmahl, Theo, to Klockner-Humboldt-Deutz Aktiengesellschaft. Front axle bearing block. 4,403,671, Cl. 180-53.00R.

Schmale & Co.: *See—*
Schmale, Karl E., 4,403,694, Cl. 206-347.000.

Schmale, Karl E., to Schmale & Co. Guide strip for conveying fittings into a stedding machine. 4,403,694, Cl. 206-347.000.

Schmeider, Adolf, to Gg. Noell GmbH. Block and pulley arrangement. 4,403,766, Cl. 254-399.000.

Schmid, Richard G.: *See—*
Fanizza, Michael A.; and Schmid, Richard G., 4,404,588, Cl. 358-60.000.

Schmidt, Gunther: *See—*
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Schmidt, Gunther, 4,404,230, Cl. 426-548.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Carbonless duplicating and marking systems. 4,403,791, Cl. 282-27.500.

Schmidt, William K., to Du Pont de Nemours, E. I., and Company. Analgesic mixture of nalbuphine and tiflamizole. 4,404,208, Cl. 424-260.000.

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Schmidt, William K., to Du Pont de Nemours, E. I., and Company. Analgesic mixture of nalbuphine and ibuprofen. 4,404,210, Cl. 424-260.000.

Schmidt, William K., to Du Pont de Nemours, E. I., and Company. Analgesic mixture of nalbuphine and flurbiprofen. 4,404,211, Cl. 424-260.000.

Schott Glaswerke: *See—*
Kiefer, Werner; and Sura, Maria, 4,404,291, Cl. 501-81.000.

Schramm, Buford J. Hubless, hingeless and bearingless helicopter rotor system. 4,403,918, Cl. 416-138.000.

Schreiber, Bruno: *See—*
Eldin, Sameer H.; and Schreiber, Bruno, 4,404,355, Cl. 528-89.000.

Schroder, Gunther: *See—*
Mercier, Olivier; Richter, Dag; and Schroder, Gunther, 4,404,025, Cl. 148-11.50F.

Schroeder, Robert W., to RoMark Technology, Inc. Automatic brush cleaner. 4,403,364, Cl. 15-4.000.

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Fastenrath, Ulrich; and Schulte, Siegfried, 4,404,535, Cl. 337-66.000.

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Fastenrath, Ulrich; and Schulte, Siegfried, 4,404,535, Cl. 337-66.000.

Schulz, Johann G. D.; and Cobler, John A., to Gulf Research & Development Company. Process for preparing coal suspensions. 4,403,998, Cl. 44-51.000.

Schurter, Rolf; Clauson-Kaas, Niels; and Rempfler, Hermann, to Ciba-Geigy Corporation. Certain esters of 2-[(2,6-dichloro-3-pyridyl)oxy]-propionic acid, compositions containing same and their herbicidal properties. 4,404,020, Cl. 71-94.000.

Schuster, Wilhelm: *See—*
Gloria, Karl; Costinescu-Tataranu, Alexander-Barbu; Schuster, Wilhelm; and Wittekind, Jurgen, 4,403,887, Cl. 405-53.000.

Schwab, Manfred: *See—*
Mohl, Helmut; Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,403,527, Cl. 74-851.000.

Schwarz, Otto; and Linnau, Yendra, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of producing a factor-VIII(AHF)-high-concentrate. 4,404,131, Cl. 260-112.00B.

Schwarzenbach, Alfred, to BBC Brown, Boveri & Company Limited. Air storage installation blowout prevention device. 4,403,477, Cl. 60-659.000.

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Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,404,175, Cl. 423-329.000.

Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., to Schlumberger Technology Corporation. Salinity and lithology determination from the sodium and chlorine activation lines. 4,404,467, Cl. 250-270.000.

Schweizer, Erwin V.: *See*—
Berlin, J. Burton; and Schweizer, Erwin V., 4,403,756, Cl. 244-223.000.

Schwender, Charles F.: *See*—
Connor, David T.; Schwender, Charles F.; Sorenson, Roderick J.; and Unangst, Paul C., 4,404,138, Cl. 260-244.400.

Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Preis, Hans M., to Behringwerke Aktiengesellschaft. Method for rendering factors II and VII hepatitis-safe with a chelating agent. 4,404,187, Cl. 424-101.000.

Science Union et Cie: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,404,206, Cl. 424-258.000.
Vincent, Michel; Remond, Georges; and Bure, Jacques, 4,404,215, Cl. 424-267.000.

SCM Corporation: *See*—
Vought, Kenneth D., 4,403,876, Cl. 400-144.200.
Vought, Kenneth D.; and Faes, Steven M., 4,403,879, Cl. 400-674.000.

Scotia Recovery Systems Limited: *See*—
Poetschke, Leonard E., 4,403,997, Cl. 44-2.000.

Scott, Ernest R., to Scott & Fetzer Company, The. Plug connector and receptacle. 4,403,824, Cl. 339-186.00R.

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Scott, Ernest R., 4,403,824, Cl. 339-186.00R.

Scuilli, Henry G. Copying and engraving apparatus. 4,404,598, Cl. 358-296.000.

Seach, Barry G.; Muller, Hans; and Cohen, Solomon E., to James Hardie & Coy. Pty. Limited. Pipe socket forming. 4,403,938, Cl. 425-393.000.

Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., to Nalco Chemical Company. Heterocyclic/aromatic fluorocarbon surfactants. 4,404,377, Cl. 544-87.000.

Sebestyen, Gyula: *See*—
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,404,189, Cl. 424-114.000.

Seger, Fritz O., to Smith International, Inc. Reversible stepping actuator. 4,403,523, Cl. 74-128.000.

Sekiguchi, Shizuo; Miyawaki, Yozo; and Ogoshi, Toshiaki, to Lion Corporation. Process for producing high concentration solution of salt of alpha-sulfo fatty acid ester. 4,404,143, Cl. 260-400.000.

Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Water soluble epoxy ester copolymers for interior can use. 4,404,336, Cl. 525-531.000.

Serini, Volker: *See*—
Freitag, Dieter; Serini, Volker; Goossens, John; Bottenbruch, Ludwig; and Hucks, Uwe, 4,404,363, Cl. 528-486.000.

Serwatowski, Frank J. Vehicle transportable cordwood cutting machine. 4,403,535, Cl. 83-490.000.

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Ito, Tatsuo; Shomura, Takashi; Kojima, Michio; Ezaki, Norio; Sezaki, Masaji; and Niwa, Tomizo, 4,404,218, Cl. 424-274.000.

Shaffer, John W., to GTE Products Corporation. Photoflash lamp structure and fabrication process. 4,403,973, Cl. 445-28.000.

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Sekmakas, Kazys; and Shah, Raj, 4,404,336, Cl. 525-531.000.

Shakhmamedov, Rovshan I. O.: *See*—
Abdullaev, Gasan M. B. O.; Maxudov, Faramaz G. O.; Kasimov, Dzhangir A. K. O.; Mamedov, Bakhtiyar M. R. O.; Aliev, Gabil G.; Gadzhiev, Yashar A. O.; Shakhmamedov, Rovshan I. O.; and Iljushin, Alexei A., 4,403,631, Cl. 138-130.000.

Shanley, Robert L., II; and Harwood, Leopold A., to RCA Corporation. Brightness control circuit. 4,404,593, Cl. 358-168.000.

Sharik, Clyde: *See*—
Bi, Le-Khac; Dillon, Mary E.; and Sharik, Clyde, 4,404,111, Cl. 252-8.55D.

Sharp Kabushiki Kaisha: *See*—
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Koizumi, Satoru; Nakao, Hiroaki; and Tsuchitani, Takashi, 4,404,610, Cl. 360-137.000.
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Takafuji, Yutaka; Nonomura, Keisaku; Takechi, Sadatoshi; Uede, Hisashi; and Wada, Tomio, 4,404,578, Cl. 357-23.000.

Sharp, Thomas K. R., to PPG Industries, Inc. Process for planographic printing. 4,403,550, Cl. 101-452.000.

Shaw, Charles B.: *See*—
Hazelett, David A.; Shaw, Charles B.; and McCombs, Paul W., 4,403,380, Cl. 27-12.000.

Shaw, Jack B. Smoke detector - luggage combination. 4,404,550, Cl. 340-628.000.

Shell Oil Company: *See*—
Haskell, Weston W., 4,404,413, Cl. 585-2.000.
Lutz, Eugene F.; and Foster, Elton G., 4,404,406, Cl. 568-571.000.
Ten Haken, Pieter; and Webb, Shirley B., 4,404,213, Cl. 424-263.000.

Shepard, Joseph F.; and Tsang, Paul J., to International Business Machines Corporation. Formation of bit lines for ram device. 4,403,394, Cl. 29-571.000.

Sheperd, Daniel R. Telescopic gun sight. 4,403,421, Cl. 33-246.000.

Shepherd, Michael, to Wallace Murray Corporation. Modulating fluid shear coupling. 4,403,757, Cl. 192-58.00B.

Sherman, Carroll H.: *See*—
Drum, Ian; Madesburg, Richard S.; Paulsrude, Douglas M.; Sherman, Carroll H.; Turpin, Frank G.; and Wheatcroft, Gerry A., 4,404,180, Cl. 423-563.000.

Sherman, James F.; and Vukovich, William J., to General Motors Corporation. Position control mechanism for a variable drive ratio pulley system. 4,403,974, Cl. 474-11.000.

Sherwin, Martin B.: *See*—
Adams, John R.; Gelbein, Abraham P.; Hansen, Robert; Peress, Jimmy Y.; and Sherwin, Martin B., 4,404,416, Cl. 585-671.000.
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Shevokas, Edward J.; and Bathgate, William S., to Sundstrand Corporation. Face seal assembly and method of use. 4,403,778, Cl. 277-1.000.

Shiao, Daniel D.: *See*—
Altland, Henry W.; and Shiao, Daniel D., 4,404,390, Cl. 548-263.000.

Shibano, Makoto; Kakuma, Hideaki; and Yasuyama, Hisatake, to Kabushiki Kaisha Akashi Seisakusho. Hydraulic vibration tester. 4,403,511, Cl. 73-665.000.

Shibata, Fujio, to TDK Electronics Co., Ltd. Magnetic recording medium and method of manufacture. 4,404,260, Cl. 428-458.000.

Shibata, Toshihiro: *See*—
Kubota, Naohiro; Shibata, Toshihiro; and Arata, Ryozo, 4,404,301, Cl. 524-99.000.

Shibuya, Yoshimichi: *See*—
Tanaka, Masashi; Nakajima, Yutaka; Ihochi, Takahiko; and Shibuya, Yoshimichi, 4,403,832, Cl. 350-335.000.

Shijima, Syoji: *See*—
Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, 4,404,030, Cl. 106-2.000.

Shikishima Tipton Mfg. Co., Ltd.: *See*—
Kobayashi, Hisamine, 4,403,456, Cl. 51-163.200.

Shiley Incorporated: *See*—
Edelman, William; and Baranowski, Michael, 4,403,983, Cl. 604-43.000.

Shimamoto, Takeshi: *See*—
Ide, Toshimine; Shimamoto, Takeshi; and Igarashi, Yoshiaki, 4,404,481, Cl. 307-491.000.

Shimano Industrial Company Limited: *See*—
Shimano, Keizo, 4,403,787, Cl. 280-289.00H.

Shimano, Keizo, to Shimano Industrial Company Limited. Covering apparatus for a handle bar of a bicycle. 4,403,787, Cl. 280-289.00H.

Shimizu, Hiroshi, to Nippon Electric Co., Ltd. Subscriber terminal for use in a time shared bidirectional digital communication network. 4,404,672, Cl. 370-29.000.

Shimizu, Tasuku: *See*—
Hayashi, Makoto; and Shimizu, Tasuku, 4,404,682, Cl. 378-72.000.

Shinozaki, Nozomu; Neki, Shigeo; and Dohi, Takashi, to Matsushita Electric Industrial Co., Ltd. Electric sewing machine driving apparatus. 4,403,563, Cl. 112-275.000.

Shiovitz, Nathan N.: *See*—
Baker, Alan C.; Shiovitz, Nathan N.; and Whiting, George E., 4,403,435, Cl. 42-1.00F.

Shipley Company Inc.: *See*—
Taylor, Paul; and Gulla, Michael, 4,404,357, Cl. 528-153.000.

Shiraki, Manabu: *See*—
Ban, Itsuki; Shiraki, Manabu; and Egami, Kazuhito, 4,404,485, Cl. 310-198.000.

Shiseido Company, Ltd: *See*—
Ogasawara, Hirotake; Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,403,932, Cl. 425-85.000.

Shomura, Takashi: *See*—
Ito, Tatsuo; Shomura, Takashi; Kojima, Michio; Ezaki, Norio; Sezaki, Masaji; and Niwa, Tomizo, 4,404,218, Cl. 424-274.000.

Shorr, Leonard M.: *See*—
Fishler, Theodor; Ravey, Manny; and Shorr, Leonard M., 4,404,297, Cl. 523-179.000.

Shull, Bruce C., to Dow Chemical Company, The. Bilirubin assay. 4,404,286, Cl. 436-97.000.

Shuman, Ervin H. Torsionally loaded treble hook with pivotable weed guard. 4,403,437, Cl. 43-36.000.

Siaens, Gustaaf F. R.; and Van der Heijden, Johannes M. A., to U.S. Philips Corporation. Electric incandescent lamp. 4,404,491, Cl. 313-318.000.

Siddens, Jack K., to American Cyanamid Company. Method for the preparation of difluoromethoxyaromatic compounds. 4,404,148, Cl. 260-465.00F.

Siemens Aktiengesellschaft: *See*—
Almahmoud, Saad; Kraus, Hubert; and Riepl, Martin, 4,403,381, Cl. 29-25.420.
Boone, Didier; and Cousin, Rolf, 4,404,518, Cl. 324-62.000.
Heynisch, Hinrich, 4,404,494, Cl. 315-3.500.
Kleinert, Helmuth, 4,404,650, Cl. 364-900.000.
Kleinschmidt, Peter, 4,404,468, Cl. 250-342.000.
Krampe, Dietrich; and Heyl, Tilo, 4,404,501, Cl. 318-7.000.
Magori, Valentin; and Kleinschmidt, Peter, 4,404,502, Cl. 318-116.000.
Trausch, Guenter, 4,404,060, Cl. 156-632.000.

Siemens-Allis, Inc.: *See*—
Stich, Frederick A.; Kleinecke, John D.; and Robertson, Roger L., 4,404,442, Cl. 200-144.00R.
Signode Corporation: *See*—
Nikolich, Milovan, 4,403,722, Cl. 227-8.000.
Simko, Richard T.: *See*—
Drori, Joseph; Owen, William H., III; and Simko, Richard T., 4,404,475, Cl. 307-264.000.
Simon-Hartley Limited: *See*—
Austin, Eric P., 4,404,099, Cl. 210-205.000.
Simpson, Harold G.; and Roberts, Michael L., to Star Manufacturing Company of Oklahoma. Prefabricated watertight structural system. 4,403,980, Cl. 52-309.110.
Simpson, Willis D.: *See*—
Nunley, Leonard J.; Simpson, Willis D.; and Reid, William J., 4,404,649, Cl. 364-900.000.
Singer Company, The: *See*—
Cuffia, Robert P., 4,404,553, Cl. 340-728.000.
Glore, Thomas G.; and Koon, Randy G., 4,403,454, Cl. 51-135.0BT.
Herr, John A., 4,404,488, Cl. 310-239.000.
Schaeflern, Henry; and Szostak, Jan, 4,403,561, Cl. 112-237.000.
Tancs, Tibor L., 4,403,562, Cl. 112-275.000.
Singleton, Michael P.: *See*—
Ledbetter, Stephen G.; Singleton, Michael P.; Johns, Thomas J.; and Fabian, James L., 4,403,796, Cl. 285-223.000.
Sinn, Hansjorg W.; Kaminsky, Walter O.; Vollmer, Hans-Jurgen C.; and Woldt, Rudiger O. H. H., to BASF Aktiengesellschaft. Preparing ethylene polymers using Ziegler catalyst comprising cyclodienyl compound of zirconium. 4,404,344, Cl. 526-160.000.
Sinn, Herman H.: *See*—
Kinney, Dwayne R.; and Sinn, Herman H., 4,404,444, Cl. 200-153.00J.
Sircar, Ila, to Warner-Lambert Company. Substituted 6-phenyl-3(2H)-pyridazinones useful as cardiotonic agents. 4,404,203, Cl. 424-250.000.
Sis-Ter S.p.A.: *See*—
Bertellini, Gianfranco; and Fabbri, Luigi, 4,403,992, Cl. 604-410.000.
Sisti, Giorgio; Tosi, Bruno; Trestianu, Sorin; and Galli, Mario, to Carlo Erba Strumentazione S.p.A. Control valve for a direct on-column injector and injection method. 4,403,520, Cl. 73-864.810.
Sitek, George J.; and Haigh, Richard B., to Leco Corporation. Method and apparatus for controlling an analytical furnace. 4,404,461, Cl. 219-490.000.
Sjolund, John R., to Sundstrand Corporation. Capacitive differential pressure transducer. 4,403,513, Cl. 73-718.000.
Skelskey, David A., to Chicago Province of the Society of Jesus. Wind turbines. 4,403,916, Cl. 416-14.000.
SKF Industrial Trading & Development Company B.V.: *See*—
Kumpar, Zvonimir Z., 4,403,522, Cl. 74-89.000.
Skoog, Ivan H., to Minnesota Mining and Manufacturing Company. Desensitizing dyes for photographic emulsions. 4,404,277, Cl. 430-597.000.
Slagel, Edwin C., to Dataproducts Corporation. Urethane elastomer for printing belts and process therefor. 4,404,353, Cl. 528-67.000.
Slight, John R., to Post Office. Pneumatically propelled duct motor. 4,403,551, Cl. 104-138.00G.
Smilanich, Nicholas J., to Union Carbide Corporation. Miniature air cells with seal. 4,404,266, Cl. 429-27.000.
Smith, Delmar A., to Rayl, Richard L., a part interest. Snow blower auxiliary for rotary lawn mower. 4,403,433, Cl. 37-243.000.
Smith International, Inc.: *See*—
Seger, Fritz O., 4,403,523, Cl. 74-128.000.
Smith, John L., to Marconi Instruments Limited. Electrical probe apparatus. 4,403,822, Cl. 339-108.0TP.
Smith, Richard J.: *See*—
Koss, William H.; and Smith, Richard J., 4,403,814, Cl. 308-236.000.
Smith, Robert J., to General Tire & Rubber Company, The. Latch assembly for railway car hatch cover. 4,403,798, Cl. 292-256.500.
Smolik, Robert A. Electrical receptacle box assembly. 4,403,708, Cl. 220-3.500.
Snelling, Christopher, to Xerox Corporation. Electronic color printing system. 4,403,848, Cl. 355-4.000.
SNIA VISCOSA Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Angelini, Gianfranco; Leoncini, Novello; Pallesi, Bice; and Paoletti, Ugo, 4,404,157, Cl. 264-195.000.
Snider, Philip A., to Cooper Industries, Inc. Angle drive lubricator. 4,403,679, Cl. 184-64.000.
Snizek, Robert E.: *See*—
Koller, Frank H.; Peterson, Jeffrey P.; and Snizek, Robert E., 4,403,907, Cl. 414-744.00R.
Snyder, Duane E., Jr.: *See*—
Cox, Ernest R.; and Snyder, Duane E., Jr., 4,403,533, Cl. 83-56.000.
Snyder, Michael D.; and Matson, Crawford A., to Universal Instruments Corporation. Insertion head for high speed radial lead component sequencing and inserting machine. 4,403,726, Cl. 227-149.000.
Societe Chimique des Charbonnages-CDF CHIMIE: *See*—
Decroix, Jean-Claude, 4,404,299, Cl. 524-77.000.
Societe Internationale de Publicite et d'Agences Commerciales: *See*—
Ryzman de Lockerente, Serge H.; and Van de Voorde, Norbert, 4,404,105, Cl. 210-710.000.
Societe Nationale des Poudres et Explosifs: *See*—
de Lauzon, Guillaume; and Mathey, Francois, 4,404,147, Cl. 260-439.0CY.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Laffitte, Denis R. G.; Louis, Guy H.; and Raybaud, Alain M. M., 4,403,917, Cl. 416-96.00A.
Societe Nationale Elf Aquitaine (Production): *See*—
Tellier, Jacques; Chambu, Claude; Coste, Jean-Francois; and Grangette, Henri, 4,404,109, Cl. 252-8.55D.
Societe Nationale Industrielle Aerospatiale: *See*—
Goicoechea, Jose R., 4,404,633, Cl. 364-426.000.
Societe SOGEFINA Societe de Gestion Financiere Armoricaine: *See*—
Herriau, Paul, 4,403,713, Cl. 221-265.000.
Soderstrom, Sven-Erik: *See*—
Lofgren, Folke; and Soderstrom, Sven-Erik, 4,403,862, Cl. 356-437.000.
Sokolov, Jury V.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.
Sone, Chiharu: *See*—
Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, 4,404,183, Cl. 424-19.000.
Sonobe, Takashi: *See*—
Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, 4,404,183, Cl. 424-19.000.
Sony Corporation: *See*—
Amano, Yoshifumi, 4,403,831, Cl. 350-334.000.
Hata, Ikuro; and Takeda, Masashi, 4,404,546, Cl. 340-347.0DA.
Hoshimi, Susumu; and Kojima, Tadashi, 4,404,602, Cl. 360-13.000.
Hosoya, Mitsuru; Onodera, Toshio; and Tanimura, Ken, 4,403,403, Cl. 29-602.00R.
Sakamoto, Hitoshi, 4,404,601, Cl. 360-10.300.
Sakamoto, Hitoshi, 4,404,605, Cl. 360-77.000.
Tatami, Mitsushige, 4,404,583, Cl. 358-13.000.
Sorenson, Roderick J.: *See*—
Connor, David T.; Schwender, Charles F.; Sorenson, Roderick J.; and Unangst, Paul C., 4,404,138, Cl. 260-244.400.
Sorin, Georgia L. Paper fastener device system. 4,403,883, Cl. 402-79.000.
Souma, Masahiro: *See*—
Moriya, Hisanori; Momono, Masakichi; Souma, Masahiro; and Nagano, Masami, 4,403,741, Cl. 239-585.000.
South African Inventions Development Corporation: *See*—
Holscher, Hobbe D., 4,403,857, Cl. 356-5.000.
Southern Gas Association: *See*—
Edlund, Carl E.; and Sparks, Cecil R., 4,404,646, Cl. 364-803.000.
Southwest Research Institute: *See*—
Dimitroff, Edward; and Vitkovits, John A., 4,403,576, Cl. 123-3.000.
Sparks, Cecil R.: *See*—
Edlund, Carl E.; and Sparks, Cecil R., 4,404,646, Cl. 364-803.000.
Spear, Joseph F., Jr.: *See*—
Engle, William R.; Moore, E. Neil, Jr.; Spear, Joseph F., Jr.; and Rockland, Ronald H., 4,403,614, Cl. 128-419.00D.
Speca, Anthony N.; Katzen, Stanley J.; and Rekers, Louis J., to National Petro Chemicals Corporation. Process for polymerizing olefins in the presence of a titanium-phosphorus-chromium catalyst. 4,404,340, Cl. 526-97.000.
Spence, Gavin G.: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,404,310, Cl. 524-457.000.
Spencer, Robert C., Jr.: *See*—
Johnson, Lloyd H.; Couchman, Robert S.; Spencer, Robert C., Jr.; Booth, John A.; and Holman, Russell J., 4,403,476, Cl. 60-652.000.
Speranza, George P.: *See*—
Klein, Howard P.; and Speranza, George P., 4,404,120, Cl. 252-426.000.
Klein, Howard P.; and Speranza, George P., 4,404,121, Cl. 252-426.000.
Sperber, Werner: *See*—
Osegowitsch, Viktor; Sperber, Werner; and Viehrig, Wolfgang, 4,403,846, Cl. 354-310.000.
Sperling, Norman; and Loui, George. Star finder. 4,403,422, Cl. 33-268.000.
Sperry Corporation: *See*—
Naaktgeboren, Adrianus, 4,403,544, Cl. 100-189.000.
Ransom, Stephen A.; and Stickel, Tedd K., 4,404,480, Cl. 307-475.000.
Spielman, Lyle S., to Eclipse, Inc. Gas mixing burner. 4,403,947, Cl. 431-353.000.
Spinelli, Harry J.; and Thompson, Alan L., to Du Pont de Nemours, E. I., and Company. Clear coat/color coat finish from a high solids coating composition of a blend of a low molecular weight acrylic polymer and a medium molecular weight acrylic polymer and an alkylated melamine cross-linking agent. 4,404,248, Cl. 428-215.000.
Spiteri, Joseph. Multiplex strobe light. 4,404,498, Cl. 315-241.00R.
Sporkenbach, Jutta; Eggensperger, Heinz; Bucklers, Lothar; Ehlers, Helmut H.; Eigener, Ulrich; and Harke, Hans-Peter, to Sterling Drug Inc. Virucidal method. 4,404,191, Cl. 424-130.000.
Sprague Electric Company: *See*—
Giacomello, Giacomo, 4,403,393, Cl. 29-570.000.

Springer, Helmut: *See—*
Cornils, Boy; Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,404,410, Cl. 568-858.000.

Springolo, Vanna: *See—*
Bonaldi, Antonio; Molinari, Egidio; and Springolo, Vanna, 4,404,199, Cl. 424-238.000.

Springston, Preston S., to United States of America, Navy. System for rapid repair of damaged airfield runways. 4,404,244, Cl. 428-109.000.

Sproul, David D.: *See—*
Rentler, Robert J.; and Sproul, David D., 4,404,008, Cl. 62-11.000.

Squier, Joann H., to Mobil Oil Corporation. Film laminate food wrap and food pouch therefrom. 4,404,242, Cl. 428-35.000.

Srnka, Leonard J.: *See—*
Hughes, Ronald W.; and Srnka, Leonard J., 4,404,612, Cl. 361-31.000.

Stabenow, Joachim: *See—*
Marosi, Laszlo; Schlimper, Hans-Ulrich; Schwarzmann, Matthias; and Stabenow, Joachim, 4,404,175, Cl. 423-329.000.

Stach, Leonard J.; and Hokama, Takeo, to Velsicol Chemical Corporation. Furfuryl amides of phenoxyphenoxyalkanoic acids and herbicidal use. 4,404,018, Cl. 71-88.000.

Stacher, Miguel A., to Aktiengesellschaft Adolf Saurer. Apparatus for tensioning the warp thread sheet of a loom. 4,403,630, Cl. 139-102.000.

Staffa, Jeffrey A.: *See—*
Lionelle, Joseph E.; and Staffa, Jeffrey A., 4,404,146, Cl. 260-429.900.

Stahl, Michael L. Device for use in straightening or relaxing hair, and method therefor. 4,403,622, Cl. 132-43.00R.

Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive mixture and copying material prepared therefrom with novolak having brominated phenol units. 4,404,272, Cl. 430-192.000.

Stain, Donald B.: *See—*
Bailey, Ernst C.; Vickers, William E.; and Stain, Donald B., 4,404,173, Cl. 422-257.000.

Stamicarbon B.V.: *See—*
Meyer, Peter J. N.; and Penders, Josef M., 4,404,391, Cl. 548-552.000.
van der Loos, Jozef L. M.; and Tijssen, Jan, 4,404,323, Cl. 525-86.000.

Stamper, Eugene E., to Witco Chemical Corporation. Barrel pump. 4,403,926, Cl. 417-553.000.

Standard Microsystems Corp.: *See—*
Tweedy, John F., Jr.; and Herman, Morton B., 4,404,554, Cl. 340-750.000.

Standard Oil Company (Ind.): *See—*
Neidleman, Saul L.; and Geigert, John, 4,404,283, Cl. 435-134.000.

Standard Oil Company (Indiana): *See—*
Oltrogge, Robert D., 4,404,086, Cl. 208-11.00R.
Vasalos, Iacovos, 4,404,083, Cl. 208-8.00R.
York, Earl D.; Thacker, Milton B.; and Miller, Paul B., 4,404,085, Cl. 208-11.00R.

Stanford, James R.: *See—*
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,404,377, Cl. 544-87.000.

Stanford University: *See—*
Huggins, Robert A.; and Gur, Turgut M., 4,404,068, Cl. 204-59.00R.

Stangle, Lynn B. Unitary self-contained physical conditioning structure. 4,403,772, Cl. 272-78.000.

Stanton, George E.; and McFadden, Patrick A., to Njuack Oil Pump Corporation. Apparatus and method for pumping a liquid from a well. 4,403,919, Cl. 417-53.000.

Star Manufacturing Company of Oklahoma: *See—*
Simpson, Harold G.; and Roberts, Michael L., 4,403,980, Cl. 52-309.110.

Stastny, Joseph F., to Cemen, Tech, Inc. Support device for mixer auger. 4,403,864, Cl. 366-19.000.

Stauffer Chemical Company: *See—*
Leitner, George J., 4,404,313, Cl. 524-512.000.

STE Look: *See—*
Bernard, Jean; Beyl, Jean; Campillo, Christian; Guerreau, Rene; Le Faou, Daniel; and Peyre, Henri, 4,403,788, Cl. 280-605.000.

Stearns & Foster Company, The: *See—*
Wolfe, Richard E.; and Fiechtner, Marvin G., 4,403,446, Cl. 47-58.000.

Steeg, Michael: *See—*
Hodes, Erich; and Steeg, Michael, 4,404,263, Cl. 428-564.000.

Steffan, Wolfgang, to CHEMOKOL Gesellschaft zur Entwicklung von Kollagenprodukten. Method of making collagen fibers for surgical use. 4,404,033, Cl. 106-161.000.

Steigerwald, Robert L., to General Electric Company. Maximum power control for a solar array connected to a load. 4,404,472, Cl. 307-46.000.

Stein, Richard J., to GTE Laboratories Incorporated. Semiconductor device design and process. 4,403,396, Cl. 29-571.000.

Steinkuhl, Bernd: *See—*
Hauschopp, Alois; Breuer, Oswald; and Steinkuhl, Bernd, 4,403,809, Cl. 299-34.000.

Steklenski, David J., to Eastman Kodak Company. Polymer compositions containing crosslinked silicone polycarbinol and having a low coefficient of friction. 4,404,276, Cl. 430-531.000.

Stella, Antonio; and Canova, Giuseppe, to R.B.L. Riello Bruciatori Legnago S.p.A. Flame surveying means in burner ignition. 4,403,943, Cl. 431-31.000.

Stephan, Gerard, to Nadella. Radial bearing assembly. 4,403,812, Cl. 308-184.00R.

Stephen, Alex. Golf seat. 4,403,806, Cl. 297-217.000.

Stephens, Geoffrey B.: *See—*
Cranford, Hayden C., Jr.; Hoffman, Charles R.; and Stephens, Geoffrey B., 4,404,577, Cl. 357-23.000.

Stephenson, Rebecca A. G.; Dietrich, Paul S.; DuBois, Grant E.; and Bunes, Leonard A., to Dynapol. Glucosubstituented diterpenoid sweeteners. 4,404,367, Cl. 536-18.100.

Sterling Drug Inc.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,403,791, Cl. 282-27.500.
Sporkenbach, Jutta; Eggensperger, Heinz; Bucklers, Lothar; Ehlers, Helmut H.; Eigener, Ulrich; and Harke, Hans-Peter, 4,404,191, Cl. 424-130.000.

Stern, Richard M., to Riker Laboratories, Inc. Antimicrobial 8-substituted benzo [IJ]quinolizines. 4,404,207, Cl. 424-258.000.

Stevens, Arthur P.; De Matteo, John; and Beard, Richard M., to United States of America, Navy. Quick deployment vehicle. 4,404,666, Cl. 367-131.000.

Stevens Engineering, Inc.: *See—*
Coope, Robert L., 4,403,389, Cl. 29-561.000.

Stevens, William M.; and Timperman, Eugene L., to Randam Electronics, Inc. Linkable sample-tube carrying tray with tabs and gears. 4,403,687, Cl. 198-472.000.

Stich, Frederick A.; Kleinecke, John D.; and Robertson, Roger L., to Siemens-Allis, Inc. Circuit interrupter having flash plates with interrupted surfaces. 4,404,442, Cl. 200-144.00R.

Stichting Vrienden van de Stichting Dr. Karl Landsteiner: *See—*
Ricotti, Giulia C. B. A.; and Zeijlemaker, Willem P., 4,404,279, Cl. 435-68.000.

Stickel, Tedd K.: *See—*
Ransom, Stephen A.; and Stickel, Tedd K., 4,404,480, Cl. 307-475.000.

Still, Wolfgang, to Wickmann-Werke AG. Electrical fuse. 4,404,536, Cl. 337-201.000.

Stoffel, James C., to Xerox Corporation. Two dimensional radiometric compensation for scanning apparatus. 4,404,597, Cl. 358-293.000.

Stogis, James: *See—*
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,404,295, Cl. 521-172.000.

Stoldt, Jurgen: *See—*
Meins, Wolfgang; Stoldt, Jurgen; and Rose, Peter, 4,403,709, Cl. 220-90.400.

Stolzle, Karl: *See—*
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Stow, Richard G., to U.S. Philips Corporation. Projection television apparatus. 4,404,500, Cl. 315-386.000.

Streater, Richard W.: *See—*
Long, John R.; Miner, Carla J.; Streater, Richard W.; and Baraff, David R., 4,404,555, Cl. 340-784.000.

Streicher, Rolf: *See—*
Lach, Dietrich; Streicher, Rolf; and Bolz, Gerhard, 4,403,993, Cl. 8-94.240.

Strem, Ervin H., Jr.; and Van Hulle, Gary L., to General Motors Corporation. Sliding sunroof with power operated ventilator. 4,403,805, Cl. 296-221.000.

Stroh, Walter: *See—*
Mohl, Helmut; Muller, Alfred; Schwab, Manfred; and Stroh, Walter, 4,403,527, Cl. 74-851.000.

Stryer, Arthur N., to Data General Corporation. Phase locked loop with compensation for loop phase errors. 4,404,530, Cl. 331-1.00A.

Styok, Wayne G., to Caterpillar Tractor Co. Engine radiator support and guard assembly. 4,403,648, Cl. 165-76.000.

Subba, Bookinkere C.: *See—*
Menon, Kuruvakkat K. G.; Raman, Hariharan; Sarma, Vadali S.; and Subba, Bookinkere C., 4,404,015, Cl. 71-77.000.

Subotics, Gyula; Subotics, Gyulane; and Nagy, Lajos, to Subotics, Gyula; Subotics, Gyulane; and Nagy, Lajos. Logic toy. 4,403,776, Cl. 273-153.00R.

Subotics, Gyulane: *See—*
Subotics, Gyula; Subotics, Gyulane; and Nagy, Lajos, 4,403,776, Cl. 273-153.00R.

Sudoh, Giichi; Minegishi, Keiichi; Ishizaki, Kanjiro; and Uchida, Ikuo, to Chichibu Cement Kabushikikaisha. Process for producing hydraulic cements. 4,404,031, Cl. 106-90.000.

Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, to Yoshitomi Pharmaceutical Industries, Ltd. Method of producing polyurethanes. 4,404,352, Cl. 528-45.000.

Sugihara, Hideki: *See—*
Okada, Tomoyuki; Fukuda, Masuo; and Sugihara, Hideki, 4,404,042, Cl. 148-6.200.

Sugita, Yutaka: *See—*
Ikeda, Tadashi; Tsumita, Norikazu; and Sugita, Yutaka, 4,404,233, Cl. 427-35.000.

Suhr, Peter J.: *See—*
Livia, Michael R.; Gould, William S.; and Suhr, Peter J., 4,403,688, Cl. 198-785.000.

Sullinger, Richard. Earth boring machine and method. 4,403,664, Cl. 175-24.000.

Sullivan, William R.: *See—*
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Sulzer Brothers Limited: *See—*
Jankovsky, Frantisek; and Lincke, Paul, 4,403,634, Cl. 139-452.000.

Sumi, Yorinobu: *See—*
Thujiuchi, Yoshio; and Sumi, Yorinobu, 4,403,829, Cl. 350-289.000.

Sumitomo Bakelite Company Ltd.: *See—*
Miki, Kyosuke; Takeuchi, Masahiro; and Suzuki, Toshio, 4,404,162, Cl. 264-514.000.

Sumitomo Chemical Company, Limited: *See—*
Toyoshima, Yoshiki; Hara, Sumio; and Nakazyo, Masaki, 4,404,000, Cl. 44-62.000.
Uematsu, Tamon; Hashimoto, Shunichi; and Matsumoto, Hiroshi, 4,404,019, Cl. 71-92.000.

Sundstrand Corporation: *See—*
Shevokas, Edward J.; and Bathgate, William S., 4,403,778, Cl. 277-1.000.
Sjolund, John R., 4,403,513, Cl. 73-718.000.

Sunpower Systems Inc.: *See—*
Minto, Wallace L., 4,403,643, Cl. 165-1.000.

Supertex, Inc.: *See—*
Chao, Robert L., 4,404,477, Cl. 307-297.000.

Sura, Maria: *See—*
Kiefer, Werner; and Sura, Maria, 4,404,291, Cl. 501-81.000.

Surma, Erich: *See—*
Peters, Heinrich; and Surma, Erich, 4,404,113, Cl. 252-75.000.

Suzuki, Atsushi; and Ninomiya, Masakazu, to Nippondenso Co., Ltd. Method and apparatus for optimum control for internal combustion engines. 4,403,584, Cl. 123-417.000.

Suzuki, Kunio: *See—*
Miyano, Tetsuji; Suzuki, Kunio; and Harada, Nobuo, 4,404,378, Cl. 544-131.000.

Suzuki, Seiko: *See—*
Yamada, Kazuji; Nishihara, Motohisa; Sato, Hideo; Suzuki, Seiko; and Kobayashi, Ryoichi, 4,404,539, Cl. 338-3.000.

Suzuki, Shintaro; Iizuka, Sadao; and Moriya, Yoshimi, to Kanto Denka Kogyo Co., Ltd. Production of magnetic powder. 4,404,024, Cl. 75-0.5BA.

Suzuki, Sousuke, to Furnace Industrial Co., Ltd. Apparatus and process of transferring the vessels in a tunnel furnace. 4,403,953, Cl. 432-122.000.

Suzuki, Takahiko: *See—*
Kageyama, Hidehei; and Suzuki, Takahiko, 4,403,691, Cl. 206-214.000.

Suzuki, Takeshi, to Tomita Pharmaceutical Corporation, Limited. Process for preparing compositions for perfusing artificial kidney systems for dialysis. 4,404,192, Cl. 424-153.000.

Suzuki, Toshio: *See—*
Miki, Kyosuke; Takeuchi, Masahiro; and Suzuki, Toshio, 4,404,162, Cl. 264-514.000.

Suzuki, Yasoji: *See—*
Saeki, Yukihiro; Tanaka, Fuminari; and Suzuki, Yasoji, 4,404,663, Cl. 365-206.000.

Swann, David A.: *See—*
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,404,188, Cl. 424-105.000.

Swann, David T. Exercising apparatus. 4,403,773, Cl. 272-134.000.

Swanson, Douglas L.; and Turk, Ronald K., to Swanson Systems, Inc. Programmable multiple position machine. 4,404,505, Cl. 318-561.000.

Swanson Systems, Inc.: *See—*
Swanson, Douglas L.; and Turk, Ronald K., 4,404,505, Cl. 318-561.000.

Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, to Millmaster Onyx Group, Inc. Process for producing aliphatic amines. 4,404,403, Cl. 564-473.000.

Swift, Harold E.; Innes, Robert A.; and Onopchenko, Anatoli, to Millmaster Onyx Group, Inc. Process for producing aliphatic amines. 4,404,404, Cl. 564-473.000.

Syntex (U.S.A.) Inc.: *See—*
Christensen, Terrence B.; McNaughton, Allen D.; and Umbach, Steven R., 4,403,989, Cl. 604-137.000.

Syrbius, Gerhard: *See—*
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,404,101, Cl. 210-232.000.

Syva Company: *See—*
Hu, Mae W.; Colvin, Floyd W.; and Ullman, Edwin F., 4,404,278, Cl. 435-7.000.

Szasz, Gyorgy: *See—*
Kokosi, Jozsef; Hermecz, Istvan; Meszaros, Zoltan; Szasz, Gyorgy; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Breining, Tibor, 4,404,205, Cl. 424-251.000.

Szasz, Tibor: *See—*
Bauer, Helmut; and Szasz, Tibor, 4,403,790, Cl. 280-637.000.

Szendrodi, Valer; Radics, Gyula; Varga, Tivadar; Vass, Tibor; and Gyurics, Karoly, to Ikarus Karosszeria es Jarmugyar. Passenger and luggage transfer system. 4,403,803, Cl. 296-179.000.

Szostak, Jan: *See—*
Schaeflern, Henry; and Szostak, Jan, 4,403,561, Cl. 112-237.000.

T & R Chemicals, Inc.: *See—*
Alvarez, Jose A. A.; and Thompson, Ralph B., 4,404,202, Cl. 424-248.500.

Tabata, Yasuyuki: *See—*
Satoh, Hiroaki; Tabata, Yasuyuki; Gomikawa, Kouichi; and Hiruta, Masaru, 4,404,171, Cl. 422-241.000.

Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state color imager with stripe or mosaic filters. 4,404,586, Cl. 358-44.000.

Tachikawa Spring Co., Ltd.: *See—*
Urai, Muneharu, 4,403,356, Cl. 5-481.000.

Tachiuchi, Tsuguji: *See—*
Hirahata, Shigeru; Ikeda, Tetsuya; Tachiuchi, Tsuguji; Komatsu, Shigeru; and Takezawa, Teruhiro, 4,404,552, Cl. 340-721.000.

Taco, Inc.: *See—*
Lebkuchner, Benno, 4,404,483, Cl. 310-42.000.

Tai, Ho T., to Lever Brothers Company. Enzymatic liquid cleaning composition. 4,404,115, Cl. 252-135.000.

Taiyo Shokai Co., Ltd.: *See—*
Nagano, Mitsuo, 4,403,718, Cl. 226-27.000.

Tajima, Yoshio: *See—*
Miyoshi, Mituji; Matsuura, Kazuo; and Tajima, Yoshio, 4,404,342, Cl. 526-125.000.

Takada, Munekazu, to Unitika Ltd. Object solid figure recognizing method and apparatus. 4,404,684, Cl. 382-25.000.

Takafuji, Yutaka; Nonomura, Keisaku; Takechi, Sadatoshi; Uede, Hisashi; and Wada, Tomio, to Sharp Kabushiki Kaisha. Structure of thin film transistors. 4,404,578, Cl. 357-23.000.

Takagi, Izumi, to Kawasaki Jukogyo Kabushiki Kaisha. Clutch for belt drive. 4,403,976, Cl. 474-19.000.

Takagi, Teiitsu: *See—*
Higuchi, Tetsuo; Takagi, Teiitsu; Fujitani, Toshihide; and Haruta, Yasuhiko, 4,404,318, Cl. 524-588.000.

Takahashi, Sadao; and Matsushita, Nobuo, to Toshiba Electric Equipment Corporation. Luminaire. 4,404,620, Cl. 362-304.000.

Takahashi, Yoshitaka: *See—*
Makabe, Hachiro; Orii, Akira; and Takahashi, Yoshitaka, 4,403,560, Cl. 112-158.00E.

Takano, Kiyonami: *See—*
Okuo, Takayasu; and Takano, Kiyonami, 4,404,482, Cl. 310-11.000.

Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Electro-magnetic powder clutch system for automobiles. 4,403,683, Cl. 192-0.052.

Takasuke, Nakanishi, to Nakanishi Dental Mfg., Co., Ltd. Dental handpiece having an optical fiberscope. 4,403,956, Cl. 433-29.000.

Take, Katsuo: *See—*
Kokubu, Tokio; and Take, Katuo, 4,404,312, Cl. 524-504.000.

Takechi, Sadatoshi: *See—*
Takafuji, Yutaka; Nonomura, Keisaku; Takechi, Sadatoshi; Uede, Hisashi; and Wada, Tomio, 4,404,578, Cl. 357-23.000.

Takeda Chemical Industries: *See—*
Goto, Jugo; Mochizuki, Kazutaka; Kubota, Tsutomu; and Miyamoto, Reiji, 4,404,320, Cl. 525-58.000.

Takeda, Masashi: *See—*
Hata, Ikuro; and Takeda, Masashi, 4,404,546, Cl. 340-347.0DA.

Takeda, Mikio; Honma, Yasushi; and Tsuzurahara, Kei, to Tanabe Seiyaku Co., Ltd. 2-Pyridinecarboxamide derivatives compositions containing same and method of using same. 4,404,214, Cl. 424-266.000.

Takei, Toshihiro: *See—*
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunaku, 4,403,910, Cl. 415-53.00T.

Takematsu, Yoshiyuki, to Fuji Koeki Corporation. Power supplying apparatus. 4,404,497, Cl. 315-241.00P.

Takesako, Yoshinobu: *See—*
Nonomura, Kinzo; Watanabe, Masanori; Takesako, Yoshinobu; Irie, Hiroyuki; and Ide, Susumu, 4,404,493, Cl. 313-422.000.

Takeuchi, Masahiro: *See—*
Miki, Kyosuke; Takeuchi, Masahiro; and Suzuki, Toshio, 4,404,162, Cl. 264-514.000.

Takezawa, Teruhiro: *See—*
Hirahata, Shigeru; Ikeda, Tetsuya; Tachiuchi, Tsuguji; Komatsu, Shigeru; and Takezawa, Teruhiro, 4,404,552, Cl. 340-721.000.

Takezono, Tetsuya: *See—*
Fujiwara, Yasuo; and Takezono, Tetsuya, 4,404,409, Cl. 568-697.000.

Taki, Yoichiro: *See—*
Ona, Isao; Ozaki, Masaru; and Taki, Yoichiro, 4,404,035, Cl. 106-271.000.

Takimoto, Hiroyuki: *See—*
Ushiro, Tatsuzo; and Takimoto, Hiroyuki, 4,404,595, Cl. 358-227.000.

Talbot, Terence R., to Rockwell International Corporation. Apparatus for bending channel section members. 4,403,495, Cl. 72-383.000.

Tam, Matthias L.; and Custode, Frank Z., to Rockwell International Corporation. ROM With redundant ROM cells employing a highly resistive polysilicon film for programming the cells. 4,404,581, Cl. 357-59.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Takeda, Mikio; Honma, Yasushi; and Tsuzurahara, Kei, 4,404,214, Cl. 424-266.000.

Tanaka, Fuminari: *See—*
Saeki, Yukihiro; Tanaka, Fuminari; and Suzuki, Yasoji, 4,404,663, Cl. 365-206.000.

Tanaka, Kanichi; and Hidaka, Kensuke, to Fukuda Metal Foil & Powder Co., Ltd. Hard facing nickel-base alloy. 4,404,049, Cl. 148-427.000.

Tanaka, Masashi; Nakajima, Yutaka; Ihochi, Takahiko; and Shibuya, Yoshimichi, to Hitachi, Ltd. Liquid crystal display device. 4,403,832, Cl. 350-335.000.

Tancs, Tibor L., to Singer Company, The. Thread picker circuit for industrial sewing machine. 4,403,562, Cl. 112-275.000.

Tanga, Michifumi: *See—*
Hata, Akio; and Tanga, Michifumi, 4,404,337, Cl. 526-62.000.

Tange Industries, Ltd.: *See—*
Tange, Yasuhiro, 4,404,458, Cl. 219-150.00R.

Tange, Yasuhiro, to Tange Industries, Ltd. Attachment of fork fitting to fork leg. 4,404,458, Cl. 219-150.00R.

Tangonan, Gregory L.; and Persechini, David L., to Hughes Aircraft Company. Integrated optics thin film devices and fabrication thereof. 4,403,825, Cl. 350-96.110.

Taniguchi, Hiroyuki, to Yanmar Diesel Engine Co., Ltd. Fuel injection pump of internal combustion engine. 4,403,586, Cl. 123-509.000.

Taniguchi, Makoto: *See*—
Nagayama, Yasuji; and Taniguchi, Makoto, 4,404,661, Cl. 365-203.000.

Tanikawa, Kowji, to Olympus Optical Co., Ltd. Endoscope photographing system. 4,403,605, Cl. 128-6.000.

Tanikella, Murty S. S. R., to Du Pont de Nemours, E. I., and Company. Hydrogenolysis of polyols to ethylene glycol in nonaqueous solvents. 4,404,411, Cl. 568-861.000.

Tanimura, Ken: *See*—
Hosoya, Mitsuru; Onodera, Toshio; and Tanimura, Ken, 4,403,403, Cl. 29-602.00R.

Tanimura, Shigeru: *See*—
Kobayashi, Shigeki; Iwasaki, Norio; Ikeda, Yasunori; Miyake, Tamio; and Tanimura, Shigeru, 4,404,683, Cl. 382-6.000.

Taplin, John F.: *See*—
Fisher, Richard T., 4,403,765, Cl. 251-65.000.

Tapphorn, Ralph M.: *See*—
Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., 4,404,467, Cl. 250-270.000.

Tarng, Ming L.; and Hicinbothem, Walter A., Jr., to RCA Corporation. Method for improving adhesion of metal film on a dielectric surface. 4,404,235, Cl. 427-89.000.

Tashkentsky Nauchnoissledovatelsky I Proektny Institut Stroitelnykh Materialov: *See*—
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Tashpulatov, Turgun K.: *See*—
Nudelman, Boris I.; Chepkalenko, Mikhail G.; Gasanova, Alevtina A.; Galimova, Guzal A.; Khaichkis, Roza; Uraev, Ravkhat E.; Tashpulatov, Turgun K.; Butaev, Erkin M.; Adam, Fedor Y.; Kevvai, Arnold A.; Bodyagina, Rashida G.; Ibragimov, Sunnat I.; and Fedorov, Alexandr P., 4,404,032, Cl. 106-100.000.

Tatami, Mitsushige, to Sony Corporation. Method and apparatus for determining and controlling the sampling phase in sampling the burst signal of a color television signal. 4,404,583, Cl. 358-13.000.

Tatum, Robert N.; Hofer, Robert W.; and Zarlingo, S. Paul, to Olin Corporation. Multi-gauge strip. 4,404,264, Cl. 428-573.000.

Taylor, Byron K., to RCA Corporation. Pickup arm retainer for video disc cartridge. 4,404,670, Cl. 369-170.000.

Taylor, David L., to Harris Corporation. Method of fabricating a vertical fuse utilizing epitaxial deposition and special masking. 4,403,399, Cl. 29-574.000.

Taylor, George W.; and Burns, Joseph R. Power generation from waves near the surface of bodies of water. 4,404,490, Cl. 310-339.000.

Taylor, George W. B.; and Barber, Richard B., to Philip Morris Incorporated. Light energy perforation apparatus and system. 4,404,454, Cl. 219-121.0LK.

Taylor, James C.: *See*—
Hamlin, Humphrey A. S.; and Taylor, James C., 4,404,005, Cl. 55-163.000.

Taylor, Paul; and Gulla, Michael, to Shipley Company Inc. High temperature naphthol novolak resin. 4,404,357, Cl. 528-153.000.

Tazaki, Shigemitsu: *See*—
Okamura, Shigeru; Kyogoku, Hiroshi; and Tazaki, Shigemitsu, 4,404,572, Cl. 346-140.00R.

TDK Electronics Co., Ltd.: *See*—
Hosaka, Akihiko; Isobe, Yukihiro; and Okuyama, Kiyotaka, 4,404,259, Cl. 428-425.900.
Ishida, Toshihiko, 4,404,245, Cl. 428-206.000.
Iwaya, Shoichi; Masumura, Hitoshi; Midori, Yoshifumi; Oikawa, Yasunobu; and Abe, Hisao, 4,404,029, Cl. 501-139.000.
Shibata, Fujio, 4,404,260, Cl. 428-458.000.

Teasdale, Raymond G., to National Research Development Corporation. Oil containment booms. 4,403,888, Cl. 405-68.000.

Tecumseh Products Company: *See*—
Campen, Kenneth W., 4,404,513, Cl. 322-90.000.

Teege, Gernot: *See*—
Horner, Michael; Horn, Dieter; Lueddecke, Erik; and Teege, Gernot, 4,404,304, Cl. 524-110.000.

Teledyne Industries, Inc.: *See*—
Rogo, Casimir; Lenz, Herman N.; and Holbrook, Michael, 4,403,914, Cl. 415-165.000.

Telex Computer Products, Inc.: *See*—
Perkins, Derrick O., 4,404,680, Cl. 375-111.000.

Tellier, Jacques; Chambu, Claude; Coste, Jean-Francois; and Grangette, Henri, to Societe Nationale Elf Aquitaine (Production). Aqueous micro-emulsions of organic substances. 4,404,109, Cl. 252-8.55D.

Temple, Davis L., Jr., to Mead Johnson & Company. Triazolopyrimidines. 4,404,380, Cl. 544-251.000.

Templeton, Andrew R.: *See*—
Orwick, Philip L.; and Templeton, Andrew R., 4,404,012, Cl. 71-92.000.

Tenenbaum, Radu R.: *See*—
Hughes, Michael G.; Tenenbaum, Radu R.; and Bugay, Al, 4,404,523, Cl. 324-207.000.

Ten Haken, Pieter; and Webb, Shirley B., to Shell Oil Company. Derivatives of certain pyridyliminomethyl-benzenes. 4,404,213, Cl. 424-263.000.

Tennant, Jerald L. Anterior chamber implant lens. 4,403,353, Cl. 3-13.000.

Terada, Hiroshi: *See*—
Okiura, Kunio; Akiyama, Iwao; Terada, Hiroshi; Arikawa, Yoshijiro; Baba, Akira; and Morita, Shigeki, 4,403,941, Cl. 431-10.000.

Terasawa, Yoshio: *See*—
Konishi, Nobutake; Naito, Masayoshi; Yatsuo, Tsutomu; and Terasawa, Yoshio, 4,404,580, Cl. 357-38.000.

Terpay, John M., to Reeves Bros., Inc. Latent pressure-sensitive sheet material and method of making same using solvent-based pressure-sensitive adhesive. 4,404,243, Cl. 428-62.000.

Terra Corporation: *See*—
Rogers, Noel A., 4,404,685, Cl. 455-76.000.

Teufelberger, Arnulf, to BBC Brown, Boveri & Company Limited. Excess pressure turbine with a constant pressure regulation stage. 4,403,915, Cl. 415-199.500.

Texaco Inc.: *See*—
Kaufman, Benjamin J.; Herbstman, Sheldon; and Levin, Mark, 4,404,001, Cl. 44-63.000.
Klein, Howard P.; and Speranza, George P., 4,404,120, Cl. 252-426.000.
Klein, Howard P.; and Speranza, George P., 4,404,121, Cl. 252-426.000.
McCoy, David R.; and McEntire, Edward E., 4,404,096, Cl. 208-188.000.

Texas Instruments Incorporated: *See*—
Curran, Patrick A., 4,403,395, Cl. 29-571.000.
Hawkins, William R., 4,403,965, Cl. 434-327.000.

Th. Goldschmidt AG: *See*—
Fock, Jurgen; and Schedlitzki, Dietmar, 4,404,324, Cl. 525-123.000.

Thacker, Milton B.: *See*—
York, Earl D.; Thacker, Milton B.; and Miller, Paul B., 4,404,085, Cl. 208-11.00R.

Thalen, Bror A.; and Brattsand, Ralph L., to Aktiebolaget Draco. 4-Pregnene-derivatives, a process for their preparation, composition and method for the treatment of inflammatory conditions. 4,404,200, Cl. 424-241.000.

Theohar, Carl: *See*—
Matejcek, Milan; Theohar, Carl; and Kleinlogel, Horst, 4,404,226, Cl. 424-326.000.

Thevenot, Francois H. J.; Goeuriot, Patrice M. V.; Driver, Julian H.; and Lebrun, Jean-Paul R., to Association pour la Recherche et le Development des Methodes et Processus Industriels (Armines). Surface-boronized pieces. 4,404,045, Cl. 148-31.500.

Thiele, Siegfried: *See*—
Altendorf, Kurt; and Thiele, Siegfried, 4,403,534, Cl. 83-100.000.

Thiokol Corporation: *See*—
Wade, Robert C., 4,404,122, Cl. 252-432.000.

Tholander, Lars H. G., to Aktiebolaget IRO. Thread storing and feeding device. 4,403,745, Cl. 242-47.010.

Thomas & Betts Corporation: *See*—
Rich, Donald S., 4,403,820, Cl. 339-97.00R.
Rich, Donald S., 4,404,425, Cl. 174-107.000.

Thomas, Caleb H., Jr., to RCA Corporation. Digital sequence detector. 4,404,542, Cl. 340-146.200.

Thomas, Craig R., to R. J. Thomas Manufacturing Co. Strong cantilevered park grill. 4,403,596, Cl. 126-25.00A.

Thomas, Daniel W.: *See*—
Cesark, Frank F.; Manfre, Robert J.; and Thomas, Daniel W., 4,403,792, Cl. 282-27.500.

Thomas, Erwin: *See*—
Grosskinsky, Otto-Alfred; Frommer, Elmar; Rapp, Gunther, deceased; and Thomas, Erwin, 4,404,176, Cl. 423-387.000.

Thomas, Lowell S., to Dow Chemical Company, The. Carbonate polymers containing a barbituate as an ignition depressant. 4,404,303, Cl. 524-100.000.

Thomas, Paul M., to Builders Equipment Company. Pallet storing and distributing apparatus. 4,403,900, Cl. 414-137.000.

Thomas, Sam S. Wheel balance indicator. 4,403,507, Cl. 73-457.000.

Thompson, Alan L.: *See*—
Spinelli, Harry J.; and Thompson, Alan L., 4,404,248, Cl. 428-215.000.

Thompson, Carroll R. Pipe pick-up and laydown machine. 4,403,898, Cl. 414-22.000.

Thompson, Harwell B.; and Wuthrich, Paul, to Timex Corporation. Water-resistant shaped case construction for a wristwatch. 4,403,870, Cl. 368-294.000.

Thompson, Ralph B.: *See*—
Alvarez, Jose A. A.; and Thompson, Ralph B., 4,404,202, Cl. 424-248.500.

Thomson, Colin; and Tweddle, Neil J., to Reckitt & Colman Products Limited. Process for the preparation of 2-(2,4-dichlorophenoxy)-phenylacetic acid. 4,404,396, Cl. 562-465.000.

Thomson-CSF: *See*—
Cornet, Jean, 4,404,656, Cl. 365-126.000.
Coynel, Daniel; and Roussigne, Maurice, 4,404,443, Cl. 200-147.00A.
Facoetti, Hugues; Petit, Patrick; Menoret, Philippe; Micheron, Francois; and Ravinet, Pierre, 4,403,382, Cl. 29-25.350.
Pepin, Christian; and Herlin, Patrick, 4,404,592, Cl. 358-125.000.
Rischmuller, Klaus, 4,404,478, Cl. 307-315.000.

Thomte, Magnus, to Interpower A/S. Liquid sampling. 4,403,517, Cl. 73-863.840.
Thorne, Michael A.: *See—*
Scherubel, Gary A.; and Thorne, Michael A., 4,404,112, Cl. 252-8.55B.
Thorud, Richard A.: *See—*
Tillotson, Henry B.; Thorud, Richard A.; and Baumann, James R., 4,403,466, Cl. 56-16.700.
Thorwart, Werner: *See—*
Gebert, Ulrich; Thorwart, Werner; Komarek, Jaromir; and Cartheuser, Carl, 4,404,384, Cl. 544-394.000.
Thrash, Tommy: *See—*
Cowan, Jack C.; Thrash, Tommy; and Rayborn, Jerry R., 4,404,107, Cl. 252-8.50M.
Thujiuchi, Yoshio; and Sumi, Yorinobu, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Angle adjusting arrangement for adjusting an element about two axes. 4,403,829, Cl. 350-289.000.
Tijssen, Jan: *See—*
van der Loos, Jozef L. M.; and Tijssen, Jan, 4,404,323, Cl. 525-86.000.
Tillotson, Henry B.; Thorud, Richard A.; and Baumann, James R., to Toro Company, The. Lawn mower engine oil drain. 4,403,466, Cl. 56-16.700.
Timex Corporation: *See—*
Crutcher, William C., 4,403,869, Cl. 368-10.000.
Thompson, Harwell B.; and Wuthrich, Paul, 4,403,870, Cl. 368-294.000.
Timms, Kelvin S.: *See—*
Eastwood, Stephen J.; and Timms, Kelvin S., 4,404,179, Cl. 423-500.000.
Timperman, Eugene L.: *See—*
Stevens, William M.; and Timperman, Eugene L., 4,403,687, Cl. 198-472.000.
Tivet Developments Ltd.: *See—*
Treharne, Timothy J. M., 4,404,229, Cl. 426-513.000.
TMC Corporation: *See—*
Bauer, Helmut; and Szasz, Tibor, 4,403,790, Cl. 280-637.000.
Toa Grout Kogyo Co., Ltd.: *See—*
Ohoka, Shinkichi; and Sano, Sakae, 4,403,891, Cl. 405-264.000.
Tobinaga, Motoi: *See—*
Iwai, Tomio; and Tobinaga, Motoi, 4,403,578, Cl. 123-73.0AD.
Toburen, Delmar K.; Toburen, Dennis L.; and Toburen, Steven R. Can crushing device. 4,403,545, Cl. 100-215.000.
Toburen, Dennis L.: *See—*
Toburen, Delmar K.; Toburen, Dennis L.; and Toburen, Steven R., 4,403,545, Cl. 100-215.000.
Toburen, Steven R.: *See—*
Toburen, Delmar K.; Toburen, Dennis L.; and Toburen, Steven R., 4,403,545, Cl. 100-215.000.
Todd, Gary J. Bow string release. 4,403,594, Cl. 124-35.00A.
Tokar, Thomas, to A-T-O Inc. Automatic spray nozzle. 4,403,661, Cl. 169-38.000.
Tokico Ltd.: *See—*
Yada, Tetsuo; and Wada, Takeo, 4,404,638, Cl. 364-510.000.
Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See—*
Hata, Akio; and Tanga, Michifumi, 4,404,337, Cl. 526-62.000.
Tokyo Aircraft Instrument Co. Ltd.: *See—*
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Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
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Hoshimi, Susumu; and Kojima, Tadashi, 4,404,602, Cl. 360-13.000.
Imai, Atsuo; and Matake, Shigeru, 4,404,268, Cl. 429-191.000.
Itai, Humio, 4,404,607, Cl. 360-105.000.
Kusakabe, Hiromi, 4,404,432, Cl. 179-1.0GS.
Maeda, Michio, 4,403,950, Cl. 432-60.000.
Murakami, Junzo, 4,404,600, Cl. 358-905.000.
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Tomita Pharmaceutical Corporation, Limited: *See—*
Suzuki, Takeshi, 4,404,192, Cl. 424-153.000.
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Jones, Darryl S.; Larkin, Donald W.; Toner, Michael F.; and Werve, Carleton E., 4,404,647, Cl. 364-900.000.
Top-Qua & Co., Ltd.: *See—*
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Tillotson, Henry B.; Thorud, Richard A.; and Baumann, James R., 4,403,466, Cl. 56-16.700.
Torto, Nicholas L.; and Di Nallo, Samuel R., Sr., to Coulter Systems Corporation. Office copier with articulated hinge cover. 4,403,856, Cl. 355-75.000.
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Towmotor Corporation: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
Kokubu, Tokio; and Take, Katsuo, 4,404,312, Cl. 524-504.000.
Toyo Kogyo Co., Ltd.: *See—*
Kodama, Hiroshi, 4,403,930, Cl. 418-121.000.
Toyo Seikan Kaisha Ltd.: *See—*
Hirota, Kazumi; Tsutsumi, Yotaro; Ito, Senji; Katsura, Tadahiko; Matsuoka, Kikuo; and Hori, Ichiro, 4,403,710, Cl. 220-270.000.
Kitamura, Yoichi; Hotta, Hisashi; Yurita, Chikara; and Ito, Makoto, 4,404,447, Cl. 219-64.000.
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Toyomaki, Kazuya, to Victor Company of Japan, Limited. Sample-and-hold circuit. 4,404,479, Cl. 307-353.000.
Toyoshima, Yoshiki; Hara, Sumio; and Nakazyo, Masaki, to Sumitomo Chemical Company, Limited. Middle and/or heavy distillate composition having good flow property and filterability. 4,404,000, Cl. 44-62.000.
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Traenckner, Hans-Joachim; and Kremer, Wolfgang, to Bayer Aktiengesellschaft. Aqueous dispersions based on cellulose nitrates, polyester of alkyd resins and aminoplast resins, processes for the production thereof and the use thereof for the production of coatings. 4,404,298, Cl. 524-31.000.
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Traxler, James T., to Velsicol Chemical Corporation. Xanthenone-yl esters of phosphoric and phosphonic acids. 4,404,220, Cl. 424-275.000.
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Martell, Charles R.; Leslie, Elmer N.; Isett, Don D.; and Treadwell, Stephen S., 4,403,558, Cl. 112-121.110.
Trebor Industries, Inc.: *See—*
Rosenthal, Robert D., 4,404,642, Cl. 364-571.000.
Treharne, Timothy J. M., to Tivet Developments Ltd. Method for the production of molded meat or meat-like products. 4,404,229, Cl. 426-513.000.
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Trotta, Robert A., to Gillette Company, The. Razor blade assembly. 4,403,412, Cl. 30-47.000.
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Trout, Buster B. Draw works disabling device for use with a well drilling apparatus. 4,403,655, Cl. 166-75.00R.
Trummlitz, Gunter; Eberlein, Wolfgang; Engel, Wolfhard; and Schmidt, Gunther, to Dr. Karl Thomae GmbH. 4-Hydroxy-1,2-Benzisothiazol-3(2H)-one-1,1-dioxides and salts thereof. 4,404,230, Cl. 426-548.000.
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Tsang, Paul J.: *See—*
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Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozseki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, to Pioneer Electronic Corporation. Molding compositions and diaphragms, arm pipes and head shells molded therefrom. 4,404,315, Cl. 524-521.000.
Tsumita, Norikazu: *See—*
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Tsunekawa, Masayoshi; Miyoshi, Nobuyoshi; and Komura, Tamotsu, to Sankin Industry Co., Ltd. Cyclic pyrophosphate derivatives and their preparation. 4,404,150, Cl. 260-927.00R.
Tsunemitsu, Toshiharu: *See—*
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Tukao, Toshiyuki; and Tomita, Masahiro, to Nippon Sokea, Inc. Exhaust gas cleaning element. 4,404,007, Cl. 55-523.000.
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Turcotte, Roger; and Papillon, Vincent. Device for obtaining readings of statistical variables. 4,403,774, Cl. 273-143.00R.
Turk, Ronald K.: *See—*
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Turner, Paul F.; and Gandhi, Om P., to BSD Medical Inc. Apparatus for electromagnetic radiation of living tissue and the like. 4,403,618, Cl. 128-804.000.
Turpin, Frank G.: *See—*
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Tweedy, John F., Jr.; and Herman, Morton B., to Standard Microsystems Corp. Video address generator and timer for creating a flexible CRT display. 4,404,554, Cl. 340-750.000.
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Sudoh, Giichi; Minegishi, Keiichi; Ishizaki, Kanjiro; and Uchida, Ikuo, 4,404,031, Cl. 106-90.000.
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Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, to Pioneer Electronic Corporation. Device for detecting a non-recorded segment on magnetic tape. 4,404,604, Cl. 360-71.000.
Uematsu, Tamon; Hashimoto, Shunichi; and Matsumoto, Hiroshi, to Sumitomo Chemical Company, Limited. 3-Chloro-1-phenyl-1,2,4-triazolin-5-ones and their use as herbicides. 4,404,019, Cl. 71-92.000.
Uerdingen, Walter: *See—*
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Ullman, Edwin F.: *See—*
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Umbach, Steven R.: *See—*
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Umeda, Jun-ichi: *See—*
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UNC Recovery Corporation: *See—*
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Uni-Cardan Aktiengesellschaft: *See—*
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Union Carbide Corporation: *See—*
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Keogh, Michael J., 4,404,349, Cl. 528-25.000.
Mohr, Paul H.; and Matulewicz, William N., 4,404,114, Cl. 252-75.000.
Smilanich, Nicholas J., 4,404,266, Cl. 429-27.000.
Winters, John R., 4,404,405, Cl. 564-482.000.
Union Oil Company of California: *See—*
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Unipak, Inc.: *See—*
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Air Force: *See—*
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Schaefer, James R., 4,403,813, Cl. 308-207.00R.
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Springston, Preston S., 4,404,244, Cl. 428-109.000.
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U.S. Philips Corporation: *See—*
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United Technologies Corporation: *See—*
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Woo, Savio L-Y.; and Akeson, Wayne H., 4,403,606, Cl. 128-92.00D.
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Urai, Muneharu, to Tachikawa Spring Co., Ltd. Seat cushions. 4,403,356, Cl. 5-481.000.
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Ushida, Kazuo, to Nippon Kogaku K.K. Objective lens for microscope. 4,403,835, Cl. 350-414.000.
Ushida, Yoshihisa; Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing olefin polymers or copolymers and catalyst therefor. 4,404,341, Cl. 526-125.000.
Ushiro, Tatsuzo; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Lens unit for a camera. 4,404,595, Cl. 358-227.000.
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Valdiserra, Sergio, to Matisa Materiel Industriel S.A. Plough with lateral ejectors for displacing railway track ballast. 4,403,430, Cl. 37-104.000.

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van der Loos, Jozef L. M.; and Tijssen, Jan, to Stamicarbon, B.V. Polymer composition of α-methyl styrene/acrylonitrile copolymer and graft copolymer. 4,404,323, Cl. 525-86.000.

van der Weerdt, Antonius J. A.; Plomp, Roeland; and Apeldoorn, Willem, to Naarden International N.V. Perfume compositions and perfumed materials and articles, containing phenyl-tetrahydrofurans as a fragrance. 4,404,127, Cl. 252-522.00R.

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Dimitroff, Edward; and Vitkovits, John A., 4,403,576, Cl. 123-3.000.

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Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,404,184, Cl. 424-49.000.

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Eichberger, Ernst; and Lazar, Gerhard, 4,404,027, Cl. 75-72.000.

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Heider, Manfred; Hofschneider, Josef; Schallenberger, Wolfgang; Nodes, Franz; and Kempe, Eberhard, 4,404,284, Cl. 435-291.000.

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Vollmer, Hans-Jurgen C.: *See*—
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Sherman, James F.; and Vukovich, William J., 4,403,974, Cl. 474-11.000.

W. R. Grace & Co.: *See*—
Dumbeck, Robert F.; and Welch, Phillip W., 4,404,640, Cl. 364-551.000.

Wachowski, Francois: *See*—
Bartissol, Alain; Boutin, Jean; and Wachowski, Francois, 4,404,073, Cl. 204-159.230.

Wada, Takeo: *See*—
Yada, Tetsuo; and Wada, Takeo, 4,404,638, Cl. 364-510.000.

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Wade, Robert C., to Thiokol Corporation. Preparation of supported alkali metal borohydride reagents. 4,404,122, Cl. 252-432.000.

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Hajek, Manfred; Wagner, Kuno; Uerdingen, Walter; and Wellner, Wolfgang, 4,404,379, Cl. 544-231.000.

Wagnon, Jean: *See*—
Demarne, Henri; and Wagnon, Jean, 4,404,217, Cl. 424-274.000.

Wahlstrom, Hans V.; Nilsson, Rolf E.; and Pihlgren, Kjell A., to Wahlstrom, Hans V.; and Nilsson, Rolf E. A drier cabinet for drying fire hoses or other similar hoses. 4,403,424, Cl. 34-104.000.

Waitkus, Phillip A.: *See*—
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Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,403,996, Cl. 44-1.00G.

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Ikeda, Junji; Saeki, Keizi; Wakahata, Tamotsu; and Inoue, Takao, 4,404,075, Cl. 204-159.230.

Wakou, Susumu: *See*—
Niikawa, Ryo; and Wakou, Susumu, 4,404,451, Cl. 219-80.000.

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Johnson, Marvin M.; Walker, Darrell W.; and Nowack, Gerhard P., 4,404,124, Cl. 252-466.0PT.

Walker, Jerry A.; and Hessler, Edward J., to Upjohn Company, The. Preparation of corticoids from 17-keto steroids. 4,404,142, Cl. 260-397.450.

Walker, Jimmy D.: *See—*
Reese, Walter J.; and Walker, Jimmy D., 4,403,744, Cl. 242-18.00G.

Walker-Neer Manufacturing Co. Inc.: *See—*
Willis, Clyde A., 4,403,666, Cl. 175-85.000.
Willis, Clyde A., 4,403,897, Cl. 414-22.000.

Wallace, Leonard D. Integral fishing rod, handle and reel seat. 4,403,439, Cl. 43-18.100.

Wallace Murray Corporation: *See—*
Haeck, Paul J., 4,403,684, Cl. 192-58.00B.
Shepherd, Michael, 4,403,757, Cl. 192-58.00B.

Wallace, William K.; and Giardino, David A., to Chicago Pneumatic Tool Company. Ratchet nutrunner with audible torque signal. 4,403,532, Cl. 81-483.000.

Walters, John O.; and Bard, William B., to Phillips Petroleum Company. Process control system. 4,404,637, Cl. 364-494.000.

Wang, Ching L. Neutron streak camera. 4,404,470, Cl. 250-390.000.

Wang, Yueh, to Economics Laboratory, Inc. Short chain fatty acid sanitizing composition and methods. 4,404,040, Cl. 134-22.140.

Warchol, Joseph F., to E. F. Houghton & Co. Method of quenching. 4,404,044, Cl. 148-18.000.

Ward, Desmond H. Door handle assembly. 4,403,800, Cl. 292-350.000.

Ward, Robert N.: *See—*
Ward, William L.; and Ward, Robert N., 4,404,503, Cl. 318-119.000.

Ward, William L.; and Ward, Robert N. Reciprocating electric motor. 4,404,503, Cl. 318-119.000.

Warden, Jerry T. Control valve unit for solar energy system. 4,403,602, Cl. 126-435.000.

Warncke, Ernst, to Dragerwerk Aktiengesellschaft. Pressure gas ventilated protective suit and method of operating the suit. 4,403,608, Cl. 128-201.280.

Warner, Hubert H.: *See—*
Huff, Edward R.; and Warner, Hubert H., 4,403,801, Cl. 294-93.000.

Warner-Lambert Company: *See—*
Connor, David T.; Schwender, Charles F.; Sorenson, Roderick J.; and Unangst, Paul C., 4,404,138, Cl. 260-244.400.
Haskell, Theodore H.; and Hutt, Marland P., 4,404,201, Cl. 424-246.000.
Kiraly, Ernest F.; and Ortiz, Ernest A., 4,403,414, Cl. 30-57.000.
Sircar, Ila, 4,404,203, Cl. 424-250.000.

Warren, Eugene D.; Martin, Lawrence M.; and Kinnaman, Daniel L. Apparatus and method for inspecting magnetic tape recorded material for alterations. 4,404,603, Cl. 360-33.100.

Waschle, Manfred: *See—*
Elhaus, Friedrich W.; and Waschle, Manfred, 4,404,043, Cl. 148-13.000.

Wassen, Johannes; and Honisch, Siegfried, to Mannesmann Aktiengesellschaft. Apparatus for forming a split tube. 4,403,491, Cl. 72-52.000.

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Watanabe, Kazuo, to Hitachi, Ltd. AM Stereo receiver. 4,404,431, Cl. 179-1.0GS.

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Ojima, Shin; Watanabe, Kazutaka; and Iwasaki, Hiroshi, 4,404,643, Cl. 364-705.000.

Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunaku, to Nippondenso Co., Ltd. Pump apparatus. 4,403,910, Cl. 415-53.00T.

Watanabe, Masanori: *See—*
Nonomura, Kinzo; Watanabe, Masanori; Takesako, Yoshinobu; Irie, Hiroyuki; and Ide, Susumu, 4,404,493, Cl. 313-422.000.

Watanabe, Masao: *See—*
Kurihara, Norimitsu; Kinoshita, Katsuharu; Watanabe, Masao; and Sato, Toyohiro, 4,404,533, Cl. 335-131.000.

Watanabe, Shoji; and Nakanishi, Michio, to Daicel Chemical Industries, Inc. Thermoplastic polyester resin, production of same, and orthopedic cast material produced therefrom. 4,404,333, Cl. 525-437.000.

Watanabe, Toshiyasu: *See—*
Isogai, Nobuo; Hosokawa, Motoyuki; Okawa, Takashi; Wakui, Natsuko; and Watanabe, Toshiyasu, 4,404,394, Cl. 560-204.000.

Waters Instruments, Inc.: *See—*
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Watkins, Bruce J., to Hughes Tool Company. Multiline riser support and connection system and method for subsea wells. 4,403,658, Cl. 166-355.000.

Watkins, Hugh: *See—*
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,404,307, Cl. 524-290.000.

Watmough, Thomas, to International Harvester Co. Composite metallic and refractory article and method of manufacturing the article. 4,404,262, Cl. 428-539.500.

Waukesha Bearings Corporation: *See—*
Gardner, Willis W., 4,403,873, Cl. 384-306.000.

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Jennie, Fred, 4,403,436, Cl. 42-42.00R.

Weaver, Colin R., to Rolls Royce Limited. Fluid operated nozzles for generation of vibrations in liquids. 4,403,735, Cl. 239-1.000.

Webb, Shirley B.: *See—*
Ten Haken, Pieter; and Webb, Shirley B., 4,404,213, Cl. 424-263.000.

Weber, Howard F., to Motorola, Inc. Ignition system having variable percentage current limiting. 4,403,591, Cl. 123-609.000.

Weber, Jurgen: *See—*
Cornils, Boy; Weber, Jurgen; Bernhagen, Wolfgang; and Springer, Helmut, 4,404,410, Cl. 568-858.000.

Weber, Robert N., to AMP Incorporated. Edge board lock. 4,403,819, Cl. 339-75.0MP.

Wedemeyer, Karlfried: *See—*
Heise, Klaus-Peter; and Wedemeyer, Karlfried, 4,404,400, Cl. 564-406.000.

Weil, Robert A., Jr.; Eck, Gary A.; and Fritz, Gary R., to Kimball International, Inc. Microcomputer interfaced electronic organ. 4,403,536, Cl. 84-1.010.

Weimann, Norbert: *See—*
Jabs, Gert; Dahm, Manfred; Haus, Artur; Nehen, Ulrich; Rath, Klaus; and Weimann, Norbert, 4,404,251, Cl. 428-320.600.

Weiss, Hermann; and Pasedach, Klaus, to U.S. Philips Corporation. Method of and device for coding and decoding an image of an object by means of penetrating radiation. 4,404,631, Cl. 364-414.000.

Welch, Phillip W.: *See—*
Dumbeck, Robert F.; and Welch, Phillip W., 4,404,640, Cl. 364-551.000.

Weldon, John F. Roll welding machine and method of reconditioning caster rolls. 4,404,450, Cl. 219-76.120.

Welker Engineering Company: *See—*
Welker, Robert H., 4,403,518, Cl. 73-864.340.
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Welker, Robert H., to Welker Engineering Company. Sampler apparatus. 4,403,518, Cl. 73-864.340.

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Welti, George R., to Communications Satellite Corporation. Modulator having improved bandwidth and power requirements. 4,404,532, Cl. 332-17.000.

Wenger, George M.: *See—*
March, Edward J.; and Wenger, George M., 4,403,949, Cl. 432-29.000.

Werve, Carleton E.: *See—*
Jones, Darryl S.; Larkin, Donald W.; Toner, Michael F.; and Werve, Carleton E., 4,404,647, Cl. 364-900.000.

West Company, The: *See—*
Connor, John T., 4,403,707, Cl. 215-253.000.

West-Harron, Aramynta. Disposable rodent trap. 4,403,438, Cl. 43-81.000.

Westcott, Douglas W., to International Business Machine Company. Testing embedded arrays in large scale integrated circuits. 4,404,519, Cl. 324-73.00R.

Western Electric Company, Inc.: *See—*
Gault, William A., 4,404,172, Cl. 422-248.000.
March, Edward J.; and Wenger, George M., 4,403,949, Cl. 432-29.000.
Messina, Joseph A.; and Sullivan, William R., 4,404,556, Cl. 340-825.030.

Westervelt, Dean C., to Westinghouse Electric Corp. Method of making a cellulose-free transformer coils. 4,403,404, Cl. 29-605.000.

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Fox, David A., 4,404,473, Cl. 307-125.000.
Maier, Alfred E.; and Ricci, Louis N., 4,404,446, Cl. 200-320.000.
Munsterman, Ronald S.; and Bowers, Homer C., 4,403,489, Cl. 72-16.000.
Pollard, David D.; and Krajci, Gary E., 4,404,582, Cl. 357-79.000.
Westervelt, Dean C., 4,403,404, Cl. 29-605.000.

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Wheatcroft, Gerry A.: *See—*
Drum, Ian; Madenburg, Richard S.; Paulsrude, Douglas M.; Sherman, Carroll H.; Turpin, Frank G.; and Wheatcroft, Gerry A., 4,404,180, Cl. 423-563.000.

Wheeler, Leon; and Beusch, Glenn A. Telephone call monitoring apparatus. 4,404,433, Cl. 179-7.1TP.

Whelan, Robert C.: *See—*
Laurie, Alexander S.; and Whelan, Robert C., 4,403,398, Cl. 29-572.000.

Whirlpool Corporation: *See—*
Keane, James W.; and Nordeen, Erwin E., 4,403,372, Cl. 15-339.000.

White, Beverly A.: *See—*
White, David L.; and White, Beverly A., 4,403,441, Cl. 46-11.000.

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Whitehurst, Darrell D.: *See—*
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Whiteman, Paul: *See—*
Mountz, Elton; Whiteman, Paul; Higginson, Roy C.; and Hacker, Marlin W., 4,403,804, Cl. 296-183.000.

Whiting, George E.: *See—*
Baker, Alan C.; Shiovitz, Nathan N.; and Whiting, George E., 4,403,435, Cl. 42-1.00F.

Wickmann-Werke AG: *See—*
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Wiech, Raymond E., Jr., to Witec Cayman Patents, Limited. Method for removing binder from a green body. 4,404,166, Cl. 419-36.000.

Wiedermann, Rolf, to Bayer Aktiengesellschaft. Nonflammable light foams containing urea and urethane groups in which a mono- and/or oligo-saccharide dissolved in water is reacted with a polyisocyanate in the presence of a polyol, a catalyst and a flameproofing agent. 4,404,294, Cl. 521-107.000.

Wiesinger, Wilhelm. Snap hinge of plastic material. 4,403,712, Cl. 220-339.000.

Wilcom Products, Inc.: *See*—
Campbell, Richard H., Jr.; and Noyes, John B., 4,404,636, Cl. 364-482.000.

Wilgood Corporation: *See*—
Feller, Murray F., 4,403,871, Cl. 374-1.000.

Wilhelm Altendorf GmbH & Co. KG: *See*—
Altendorf, Kurt; and Thiele, Siegfried, 4,403,534, Cl. 83-100.000.

Wilkerson, Ronald L.: *See*—
McGuire, John F.; Hurt, J. Steven; and Wilkerson, Ronald L., 4,404,639, Cl. 364-551.000.

Wilkinson, Dawn G.; and Brush, John D., to Wilkinson, Dawn G. Babyseat attachment for shopping cart. 4,403,807, Cl. 297-217.000.

Wilkinson, Lanette L.: *See*—
Wilkinson, Lawrence H.; and Wilkinson, Lanette L., 4,403,604, Cl. 128-1.00R.

Wilkinson, Lawrence H.; and Wilkinson, Lanette L. Gastric pouch. 4,403,604, Cl. 128-1.00R.

Wilkinson, Samual C. W., to Crane Packing Limited. Seals for liquid-tight closure between rotary component and partition. 4,403,779, Cl. 277-27.000.

Wilks, Gerald W., to LaSalle Steel Company. Process for the improved heat treatment of steels using direct electrical resistance heating. 4,404,047, Cl. 148-131.000.

Willemse, Adrianus H.: *See*—
Hovens, Petrus J. P.; and Willemse, Adrianus H., 4,403,853, Cl. 355-16.000.

Williams, Charles D.; and Larsen, Knut H. Filter device. 4,404,006, Cl. 55-502.000.

Williams, Errol R., Jr., to International Business Machines Corporation. Capacitive transducer for providing precise angular positional information. 4,404,560, Cl. 340-870.370.

Willis, Clyde A., to Walker-Neer Manufacturing Co. Inc. Self centering tongs and transfer arm for drilling apparatus. 4,403,666, Cl. 175-85.000.

Willis, Clyde A., to Walker-Neer Manufacturing Co., Inc. Self-centering clamp for down-hole tubulars. 4,403,897, Cl. 414-22.000.

Wilson, David H.: *See*—
Crossley, Jack; and Wilson, David H., 4,403,935, Cl. 425-210.000.

Wilson, George P. Attachment for antennas to improve reception and transmission. 4,404,564, Cl. 343-750.000.

Wilson, Stephen K.; and Beatty, Raymond I. Draw punch. 4,403,417, Cl. 30-360.000.

Windsor, Harry M.: *See*—
Norris, Peter J.; Parker, Frederick J.; and Windsor, Harry M., 4,403,682, Cl. 192-0.033.

Wing Industries, Inc.: *See*—
Herschel, Ben B.; and Chaloka, Andrew, 4,403,649, Cl. 165-101.000.

Winkels, Manfred: *See*—
Kuhlen, Ernst; and Winkels, Manfred, 4,403,925, Cl. 417-395.000.

Winnek, Douglas F.; and McKee, William J. Lenticular x-ray film with improved grating mask and intensifying screen. 4,404,471, Cl. 250-482.100.

Winters, John R., to Union Carbide Corporation. Process for the preparation of polyethylene polyamines. 4,404,405, Cl. 564-482.000.

Wirth, Hermann O.; and Friedrich, Hans-Helmut, to Ciba-Geigy Corporation. Complexed compounds, processes for their manufacture and their use. 4,404,408, Cl. 568-680.000.

Witco Chemical Corporation: *See*—
Bernstein, Carl; Stogis, James; Riddle, Travis; and Kufrin, Robert, 4,404,295, Cl. 521-172.000.
Loewrigkeit, Peter; and Dabi, Shmuel, 4,404,258, Cl. 428-424.600.
Stamper, Eugene E., 4,403,926, Cl. 417-553.000.

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Wojnarowski, Robert J.: *See*—
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Woldt, Rudiger O. H. H.: *See*—
Sinn, Hansjorg W.; Kaminsky, Walter O.; Vollmer, Hans-Jurgen C.; and Woldt, Rudiger O. H. H., 4,404,344, Cl. 526-160.000.

Wolfe, Richard E.; and Fiechtner, Marvin G., to Stearns & Foster Company, The. Hydroponic growing medium and method. 4,403,446, Cl. 47-58.000.

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Janssen, Harvey W., 4,403,663, Cl. 173-12.000.

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Bernert, Claus-Rudiger; Hartwig, Volker; Kords, Christian; and Redeker, Detmar, 4,404,370, Cl. 536-85.000.

Wollar, Burnell J., to Phillips Plastics Corp. Pull-out type expansion fastener. 4,403,893, Cl. 411-38.000.

Womako Maschinenkonstructionen GmbH: *See*—
Fabrig, Paul, 4,403,896, Cl. 412-38.000.

Woo, Edmund P., to Dow Chemical Company, The. Novel 3,5-diketopiperazinyl compounds containing epoxide substituted imides. 4,404,381, Cl. 544-357.000.

Woo, Savio L-Y.; and Akeson, Wayne H., to University of California, The Regents of the. Compatible internal bone fixation plate. 4,403,606, Cl. 128-92.00D.

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Wood, Dennis E., to Rando Machine Corporation. Means for controlling density of non-woven fiber webs. 4,403,374, Cl. 19-105.000.

Wood George & Company: *See*—
Nijjar, Amrik S., 4,403,628, Cl. 137-515.500.

Wood, Prentice J., to Mead Corporation, The. Article carrier. 4,403,689, Cl. 206-158.000.

Woodman, Daniel W., Jr., to USM Corporation. Radial lead inserting machine. 4,403,390, Cl. 29-564.100.

Wosthoff, Eckehard: *See*—
Eder, Bernd; and Wosthoff, Eckehard, 4,404,463, Cl. 219-541.000.

Wright, Stanley H. B.: *See*—
Alabaster, Ramon J.; and Wright, Stanley H. B., 4,404,392, Cl. 560-40.000.

Wright, W. Andrew, Jr., to IRI, Inc. Cable television with multi-event signal substitution. 4,404,589, Cl. 358-86.000.

Wu, Marinda L., to Dow Chemical Company, The. Use of rod mill for initial stage of solder glass grinding. 4,403,742, Cl. 241-29.000.

Wuerth, John M.: *See*—
Beilock, Milton M.; and Wuerth, John M., 4,403,838, Cl. 350-500.000.

Wujick, Frank L., to Uniroyal, Inc. Pulley for positive drive systems. 4,403,979, Cl. 474-153.000.

Wulff, Virgil W., to Mattel, Inc. Toy vehicle accelerator. 4,403,440, Cl. 46-1.00K.

Wunderer, Armin: *See*—
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Wurster, Rudolf F.; and Merz, Jurg, to Ciba-Geigy Corporation. Cationic adsorption agent. 4,404,104, Cl. 210-684.000.

Wuthrich, Paul: *See*—
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Wuthrich, Werner, to Kidde, Inc. Folding machine. 4,403,981, Cl. 493-419.000.

Wyhof, John R.: *See*—
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Wytko, Richard, to Weyerhaeuser Company. File folder box. 4,403,729, Cl. 229-39.00R.

Xerox Corporation: *See*—
Jones, John E.; and Castelli, Vittorio R., 4,403,877, Cl. 400-335.000.
Ronen, Ram S., 4,404,576, Cl. 357-23.000.
Seelling, Christopher, 4,403,848, Cl. 355-4.000.
Stoffel, James C., 4,404,597, Cl. 358-293.000.

Xicor, Inc.: *See*—
Drori, Joseph; Owen, William H., III; and Simko, Richard T., 4,404,475, Cl. 307-264.000.

Yada, Tetsuo; and Wada, Takeo, to Tokico Ltd. Flow rate measuring device. 4,404,638, Cl. 364-510.000.

Yagishita, Shigelu: *See*—
Maeda, Akio; Hashimoto, Kinro; Yagishita, Shigelu; Isagami, Masaaki; and Fukushima, Hiroshi, 4,404,329, Cl. 525-329.200.

Yamada, Akihiro: *See*—
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Yamada, Kazuji; Nishihara, Motohisa; Sato, Hideo; Suzuki, Seiko; and Kobayashi, Ryoichi, to Hitachi, Ltd. Semiconductor strain gauge. 4,404,539, Cl. 338-3.000.

Yamada, Tateo; Mamiya, Toshiharu; and Ikawa, Kazuo, to Canon Kabushiki Kaisha. Flash device. 4,404,618, Cl. 362-17.000.

Yamaguchi, Hiroaki: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; and Ozaki, Tadashi, 4,403,505, Cl. 73-117.300.

Yamaguchi, Hiroyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Output amplifier. 4,404,528, Cl. 330-288.000.

Yamaguchi, Jiro: *See*—
Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, 4,403,954, Cl. 432-124.000.

Yamaguchi, Kiyomi: *See*—
Abe, Hideki; Yamaguchi, Kiyomi; and Asano, Yuzo, 4,404,071, Cl. 204-108.000.

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Iwai, Tomio; and Tobinaga, Motoi, 4,403,578, Cl. 123-73.0AD.
Kobayashi, Seiji; and Harada, Hiroshi, 4,403,971, Cl. 440-88.000.

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Yamamoto, Hajime: *See*—
Higashida, Osamu; Moribe, Isamu; and Yamamoto, Hajime, 4,404,270, Cl. 430-110.000.

Yamamoto, Masaichi: *See*—
Fukuhara, Shoetsu; Nakamura, Yoshiaki; Ibuki, Tadahiro; and Yamamoto, Masaichi, 4,403,568, Cl. 119-14.140.

Yamamoto, Yasushi: *See*—
Nishimura, Hideo; Niwa, Kuniyuki; Yamamoto, Yasushi; and Yoneda, Takao, 4,404,506, Cl. 318-561.000.

Yamana, Toshifumi, to Rinnai Kabushiki Kaisha. Combustion detecting element. 4,404,420, Cl. 136-217.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, 4,404,373, Cl. 544-21.000.
Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, 4,404,183, Cl. 424-19.000.
Yamanouchi, Roy K., to National Semiconductor Corporation. Error correcting network. 4,404,673, Cl. 371-13.000.
Yamashita, Kyoichi, to Koyo-Jido-Ki Co., Ltd. Tape feeding system. 4,403,719, Cl. 226-188.000.
Yamashita, Kyoichi. Variable diameter drum. 4,403,721, Cl. 226-191.000.
Yamashita, Tadashi: *See*—
Kokeguchi, Hitoshi; Yamaguchi, Jiro; Sakoda, Akinori; Umeda, Mikio; Yamashita, Tadashi; Katsuki, Yoshimasa; Murakami, Mitsuru; and Imamura, Yasuo, 4,403,954, Cl. 432-124.000.
Yamazaki, Atsuki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; and Yamazaki, Atsuki, 4,404,373, Cl. 544-21.000.
Yamazaki, Suguru, to Kabushiki Kaisha Suwa Seikosha. Power circuit for electronic timepiece. 4,404,624, Cl. 363-59.000.
Yan, Tsoung-Yuan: *See*—
Audeh, Costandi A.; and Yan, Tsoung-Yuan, 4,404,092, Cl. 208-131.000.
Yanagawa, Nobuyuki, to Ricoh Company, Ltd. Electrostatic copying machine comprising improved arrangement of operating units. 4,403,851, Cl. 355-14.00R.
Yanaihara, Noboru; and Konno, Koji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Peptides and method for synthesizing the same. 4,404,133, Cl. 260-112.50R.
Yang, Rong-Juh. Children conductive intelligence autosuggestion machine. 4,403,966, Cl. 434-335.000.
Yanmar Diesel Engine Co., Ltd.: *See*—
Taniguchi, Hiroyuki, 4,403,586, Cl. 123-509.000.
Yano, Satoshi: *See*—
Saito, Yoshitane; Yamada, Akihiro; and Yano, Satoshi, 4,404,625, Cl. 364-144.000.
Yasuda, Isao; Koyama, Kazuaki; and Kawai, Yoshihiko, to Sanyo Electric Co., Ltd. Magnetic head with an improved inner core. 4,404,608, Cl. 360-126.000.
Yasuda, Seiji: *See*—
Oshima, Jiro; Aoyama, Masaharu; Yasuda, Seiji; and Yonezawa, Toshio, 4,403,392, Cl. 29-569.00R.
Yasuhara, Seishi, to Nissan Motor Company, Limited. Fuel injection control system. 4,403,582, Cl. 123-357.000.
Yasunaga, Masao: *See*—
Nagasaku, Eiichi; Yasunaga, Masao; and Kato, Kimihiro, 4,403,929, Cl. 418-82.000.
Yasuyama, Hisatake: *See*—
Shibano, Makoto; Kakuma, Hideaki; and Yasuyama, Hisatake, 4,403,511, Cl. 73-665.000.
Yatsuo, Tsutomu: *See*—
Konishi, Nobutake; Naito, Masayoshi; Yatsuo, Tsutomu; and Terasawa, Yoshio, 4,404,580, Cl. 357-38.000.
Yeda Research & Development Co. Ltd.: *See*—
Ruhman, Smil; and Scherson, Isaac, 4,404,653, Cl. 365-49.000.
Yellow Springs Instrument Company, The: *See*—
Johnson, Jay M., 4,404,066, Cl. 204-1.00T.
Yen, Anderson. Electrical control circuit for operating a garage door or similar device. 4,404,558, Cl. 340-825.720.
Yin, Lo I., to United States of America, National Aeronautics and Space Administration. Real-time 3-D x-ray and gamma-ray viewer. 4,404,469, Cl. 250-363.00R.
Yoder, Kermit L. Swath turning machine. 4,403,468, Cl. 56-370.000.
Yoho, Robert W., Sr. Combination roof mounting curb and plenum. 4,403,481, Cl. 62-259.100.
Yokozseki, Shinichi: *See*—
Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozseki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.
Yoneda, Takao: *See*—
Nishimura, Hideo; Niwa, Kuniyuki; Yamamoto, Yasushi; and Yoneda, Takao, 4,404,506, Cl. 318-561.000.
Yoneya, Satoru: *See*—
Kawata, Hiroitsu; Aruga, Masayoshi; Ohmura, Tadayoshi; Sonobe, Takashi; Yoneya, Satoru; and Sone, Chiharu, 4,404,183, Cl. 424-19.000.
Yonezawa, Toshio: *See*—
Oshima, Jiro; Aoyama, Masaharu; Yasuda, Seiji; and Yonezawa, Toshio, 4,403,392, Cl. 29-569.00R.
York, Earl D.; Thacker, Milton B.; and Miller, Paul B., to Standard Oil Company (Indiana). Drying and dedusting process. 4,404,085, Cl. 208-11.00R.
York, Floyd L. Powered wood splitter with multiple work heads. 4,403,635, Cl. 144-366.000.
Yorke, William J.; Binet, Rejean; Lee, Ming C.; and Bampfield, Howard A., to C-I-L Inc. Water-in-oil emulsion blasting agents containing unrefined or partly refined petroleum product as fuel component. 4,404,050, Cl. 149-2.000.
Yoshida, Hajime, to Hajime Industries Ltd. Defect inspection system. 4,403,858, Cl. 356-237.000.
Yoshida Industry Co., Ltd.: *See*—
Ogasawara, Hirotake; Hatakeyama, Yoshiharu; and Ishiguro, Mitsuo, 4,403,932, Cl. 425-85.000.
Yoshida, Jun; Tsunemitsu, Toshiharu; and Nakano, Masayoshi, to Kanebo Cosmetics, Inc. Foundation composition suitable for use in making up a mannequin. 4,403,963, Cl. 434-100.000.
Yoshihara, Takahisa: *See*—
Komura, Hideo; Kyohno, Kazuaki; Yoshihara, Takahisa; Shijima, Syoji; and Goto, Minari, 4,404,030, Cl. 106-2.000.
Yoshino, Toshikazu: *See*—
Tsukagoshi, Tsunehiro; Nemoto, Etsuro; Yokozseki, Shinichi; Hagiwara, Sumio; Yoshino, Toshikazu; Arai, Yasuyuki; and Kobayashi, Kazuyoshi, 4,404,315, Cl. 524-521.000.
Yoshino, Yasuhisa: *See*—
Kodera, Masao; Akita, Sigeyuki; and Yoshino, Yasuhisa, 4,404,541, Cl. 340-32.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Suenobu, Koreyoshi; Kohara, Masanori; Hidaka, Yasuhiro; Katsuyama, Kazuki; and Kinishi, Ryoichi, 4,404,352, Cl. 528-45.000.
Young, David A.: *See*—
Lagace, Linda S.; and Young, David A., 4,404,119, Cl. 252-413.000.
Young, Donald C., to Union Oil Company of California. Noncorrosive urea-sulfuric acid reaction products. 4,404,116, Cl. 252-182.000.
Young, Robert E.; and Bridgewater, Bobbie D., to General Motors Corporation. Internal combustion engine ignition distributor drive arrangement. 4,403,579, Cl. 123-146.50A.
Yurchak, Sergei: *See*—
Penick, Joe E.; Yurchak, Sergei; and Zahner, John C., 4,404,414, Cl. 585-469.000.
Yurita, Chikara: *See*—
Kitamura, Yoichi; Hotta, Hisashi; Yurita, Chikara; and Ito, Makoto, 4,404,447, Cl. 219-64.000.
Zachariadis, Robert G., to Mobil Oil Corporation. System for laterally positioning a towed marine cable and method of using same. 4,404,664, Cl. 367-19.000.
Zahner, John C.: *See*—
Penick, Joe E.; Yurchak, Sergei; and Zahner, John C., 4,404,414, Cl. 585-469.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,404,575, Cl. 357-22.000.
Zamparelli, Walter; Cimenti, Antonio; and Muscariello, Giuseppe, to Zamuci Srl. Device to spread the dough for pizza. 4,403,937, Cl. 425-337.000.
Zamuci Srl: *See*—
Zamparelli, Walter; Cimenti, Antonio; and Muscariello, Giuseppe, 4,403,937, Cl. 425-337.000.
Zarlingo, S. Paul: *See*—
Tatum, Robert N.; Hofer, Robert W.; and Zarlingo, S. Paul, 4,404,264, Cl. 428-573.000.
Zarnoch, Kenneth P.: *See*—
Iacovangelo, Charles D.; and Zarnoch, Kenneth P., 4,404,267, Cl. 429-41.000.
Zeijlemaker, Willem P.: *See*—
Ricotti, Giulia C. B. A.; and Zeijlemaker, Willem P., 4,404,279, Cl. 435-68.000.
Zelenaya, Saida A.: *See*—
Rozenfeld, Iosif L.; Brusnikina, Vera M.; Frolova, Larisa V.; Lyashenko, Alevtina A.; Sokolov, Jury V.; Bocharov, Boris V.; Fokin, Alexandr V.; Legezin, Nikolai E.; Dergobuzova, Ekaterina V.; Altshuler, Boris N.; Zelenaya, Saida A.; and Korobova, Emma S., 4,404,167, Cl. 422-12.000.
Zelenka, Thomas: *See*—
Juergensen, Heinrich; and Zelenka, Thomas, 4,404,596, Cl. 358-293.000.
Zengel, Hans G.; and Bergfeld, Manfred, to Akzona Incorporated. Process for the preparation of para-amino-diphenylamine. 4,404,401, Cl. 564-416.000.
Zenith Radio Corporation: *See*—
Fanizza, Michael A.; and Schmid, Richard G., 4,404,588, Cl. 358-60.000.
Moon, Frederick H., 4,404,686, Cl. 455-191.000.
Zerbe, Lowell B. Apparatus for supporting portable hand tools. 4,403,457, Cl. 51-170.00T.
Zieg, Steven A., to Mansion Industries, Inc. Folding saw horse. 4,403,678, Cl. 182-153.000.
Zilahi, Tibor: *See*—
Kulcsar, Gabor; Sebestyen, Gyula; David, Agoston; and Zilahi, Tibor, 4,404,189, Cl. 424-114.000.
Zimmerman, John A., Jr.; and Long, William B., to AMP Incorporated. Wiring line tap. 4,403,821, Cl. 339-97.00P.
Zimmermann, Josef: *See*—
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,403,986, Cl. 604-70.000.
Zinninger, Thomas C.; and Deli, Joseph, to PPG Industries, Inc. Composition and method for controlling growth of tobacco suckers. 4,404,016, Cl. 71-78.000.
Zrinscak, Fred S., to Mobil Oil Corporation. Process for the reduction of the effect of contaminant metals in cracking catalysts. 4,404,089, Cl. 208-120.000.
Zuk, Paul, to Bell Telephone Laboratories, Incorporated. Electrode coating process. 4,404,234, Cl. 427-37.000.
Zwarts, Johan M. C.: *See*—
Mulder, Willem; van Rooyen, Gerrit; and Zwarts, Johan M. C., 4,404,561, Cl. 343-16.00R.
Zybailo, Valentin P.; Kniga, Anatoly N.; Kosyan, Ljudmila E.; Rudenko, Valentin P.; and Poltaev, Sergei A. Data input keyboard. 4,404,547, Cl. 340-365.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF SEPTEMBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Avtex Fibers Inc.: *See*—
Smith, Frederick R., Re. 31,380, Cl. 106-164.000.

Bayer Aktiengesellschaft: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Bendix Corporation, The: *See*—
Burnett, Richard T., Re. 31,378, Cl. 188-79.5GT.

Bigelow-Sanford, Inc.: *See*—
Sheehan, Richard W.; Parlin, David B.; Jamrogowicz, Harry F.; and Patterson, John A., Re. 31,376, Cl. 57-208.000.

Burnett, Richard T., to Bendix Corporation, The. Drum brake adjuster. Re. 31,378, Cl. 188-79.5GT.

Demer, Joseph: *See*—
Mylrea, Kenneth C.; and Demer, Joseph, Re. 31,377, Cl. 128-642.000.

Deutsche Gold-und Silber-Scheideanstalt: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Dunham-Bush, Inc.: *See*—
Shaw, David N., Re. 31,379, Cl. 417-310.000.

Du Pont de Nemours, E. I., and Company: *See*—
Moore, Edward J.; and Owens, John E., Re. 31,382, Cl. 361-213.000.

Gerstenmeier, Jurgen: *See*—
Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, Re. 31,383, Cl. 364-426.000.

Jamrogowicz, Harry F.: *See*—
Sheehan, Richard W.; Parlin, David B.; Jamrogowicz, Harry F.; and Patterson, John A., Re. 31,376, Cl. 57-208.000.

Korasiak, Wolfgang: *See*—
Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, Re. 31,383, Cl. 364-426.000.

Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, to Teldix GmbH. Antilocking control system. Re. 31,383, Cl. 364-426.000.

Moore, Edward J.; and Owens, John E., to Du Pont de Nemours, E. I., and Company. Static charge neutralizer and process. Re. 31,382, Cl. 361-213.000.

Mylrea, Kenneth C.; and Demer, Joseph, to University Patents, Inc. Disposable esophageal and tracheal multi-probes. Re. 31,377, Cl. 128-642.000.

Owens, John E.: *See*—
Moore, Edward J.; and Owens, John E., Re. 31,382, Cl. 361-213.000.

Parlin, David B.: *See*—
Sheehan, Richard W.; Parlin, David B.; Jamrogowicz, Harry F.; and Patterson, John A., Re. 31,376, Cl. 57-208.000.

Patterson, John A.: *See*—
Sheehan, Richard W.; Parlin, David B.; Jamrogowicz, Harry F.; and Patterson, John A., Re. 31,376, Cl. 57-208.000.

Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, to Bayer Aktiengesellschaft; and Deutsche Gold-und Silber-Scheideanstalt. Process for the preparation of propylene oxide. Re. 31,381, Cl. 549-526.000.

Schreyer, Gerd: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Schwerdtel, Wulf: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Seifert, Hermann: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Shaw, David N., to Dunham-Bush, Inc. Combined pressure matching and capacity control slide valve assembly for helical screw rotary machine. Re. 31,379, Cl. 417-310.000.

Sheehan, Richard W.; Parlin, David B.; Jamrogowicz, Harry F.; and Patterson, John A., to Bigelow-Sanford, Inc. Yarn structure and method for producing same. Re. 31,376, Cl. 57-208.000.

Smith, Frederick R., to Avtex Fibers Inc. Rayon fibers containing starch. Re. 31,380, Cl. 106-164.000.

Swodenk, Wolf: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Teldix GmbH: *See*—
Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, Re. 31,383, Cl. 364-426.000.

University Patents, Inc.: *See*—
Mylrea, Kenneth C.; and Demer, Joseph, Re. 31,377, Cl. 128-642.000.

Waldmann, Helmut: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Weiberg, Otto: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

Wirthwein, Rolf: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolf, Re. 31,381, Cl. 549-526.000.

LIST OF DESIGN PATENTEES

AB ID-Kort: *See*—
Malmberg, Thor A. H., 270,546, Cl. D19-10.000.

Accutec, Inc.: *See*—
Bajusz, Harold F., 270,547, Cl. D19-51.000.

Achille, Jean R., to Illinois Tool Works Inc. Reverse screw grommet. 270,516, 9-13-83, Cl. D8-354.000.

American Telecommunications Corporation: *See*—
Bloem, Richard E., Sr., 270,534, Cl. D14-53.000.

Anchor Hocking Corporation: *See*—
Thrush, James L., 270,507, Cl. D7-9.000.
Thrush, James L., 270,508, Cl. D7-17.000.
Thrush, James L., 270,512, Cl. D7-54.000.

Armstrong, Lee C. Adapter for making connection into a container through a pierceable top. 270,568, 9-13-83, Cl. D24-52.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Machida, Takeshi; and Koyama, Hiroshi, 270,564, Cl. D24-1.100.

Audesse, Emery G.: *See*—
Broadt, David R.; and Audesse, Emery G., 270,575, Cl. D26-2.000.

Bajusz, Harold F., to Accutec, Inc. Pen. 270,547, 9-13-83, Cl. D19-51.000.

Bayusik, Charles M. Star of David ornament. 270,525, 9-13-83, Cl. D11-125.000.

Benattar, Robert; and Cronenberger, Michel, to Hospal-Sodip SA. Haemodialyzer or the like. 270,565, 9-13-83, Cl. D24-21.000.

Benjamin & Medwin, Inc.: *See*—
Miller, David W., 270,509, Cl. D7-43.000.
Miller, David W., 270,510, Cl. D7-44.000.

Bennett, Harry. Tube coupler for a hearing aid ear mold. 270,566, 9-13-83, Cl. D24-35.000.

Black, Allan N., to Guest Keen & Nettlefolds (Aust) Limited. Scaffold anchorage lug. 270,572, 9-13-83, Cl. D25-68.000.

Black, Allan N., to Guest Keen & Nettlefolds (Aust) Limited. Scaffold brace anchorage socket. 270,573, 9-13-83, Cl. D25-68.000.

Black, Allan N., to Guest Keen & Nettlefolds (Aust) Limited. Scaffold spring wedge. 270,574, 9-13-83, Cl. D25-68.000.

Bloem, Richard E., Sr., to American Telecommunications Corporation. Cordless telephone. 270,534, 9-13-83, Cl. D14-53.000.

Bloomquist, Thomas N. Holder for material used in the repair of automotive vehicle bodies. 270,528, 9-13-83, Cl. D12-155.000.

Bowden, Wade R., Jr.; and Hoehne, George C., to Slater Electric Inc. Portable ground fault circuit interrupter. 270,530, 9-13-83, Cl. D13-30.000.

Broadt, David R.; and Audesse, Emery G., to GTE Products Corporation. Multilamp photoflash unit. 270,575, 9-13-83, Cl. D26-2.000.

Brossier, Jean-Michel. Bath tub. 270,561, 9-13-83, Cl. D23-55.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Katsuzaki, Yoshio, 270,535, Cl. D15-70.000.

Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, to Rolodex Corporation. Combined telephone list finder and desk tray. 270,549, 9-13-83, Cl. D19-76.000.

Camus, Adriana M. Figure enhancer. 270,489, 9-13-83, Cl. D2-1.000.

Canon Kabushiki Kaisha: *See*—
Sakurai, Mitsuru, 270,540, Cl. D16-31.000.

Cascone, Ernesto; and Cascone, Vincent. Door structure. 270,569, 9-13-83, Cl. D25-48.000.

Cascone, Vincent: *See*—
Cascone, Ernesto; and Cascone, Vincent, 270,569, Cl. D25-48.000.

Cinque, Alphonse P. Lens mask. 270,542, 9-13-83, Cl. D16-38.000.

Clivio, Franco; and Raffler, Dieter, to GARDENA Kress & Kastner GmbH. Spray head. 270,559, 9-13-83, Cl. D23-35.000.

Clivio, Franco; and Raffler, Dieter, to GARDENA Kress + Kastner GmbH. Sprayer. 270,560, 9-13-83, Cl. D23-35.000.

Cohen, Piet, to Materias Plasticas, Limitada. Ring for towels. 270,503, 9-13-83, Cl. D6-99.000.

Conlin Hot Tubs/Spas: *See*—
Conlin, Michael L., 270,567, Cl. D24-38.000.

Conlin, Michael L., to Conlin Hot Tubs/Spas. Deck skirting for portable spa. 270,567, 9-13-83, Cl. D24-38.000.

Consolidated Foods Corporation: *See*—
Novitsky, Rosalie, 270,490, Cl. D2-24.000.
Novitsky, Rosalie, 270,491, Cl. D2-24.000.

Cook, William J., to Timex Corporation. Digital alarm clock. 270,522, 9-13-83, Cl. D10-15.000.

Coronado, Hector M. Chair or the like. 270,502, 9-13-83, Cl. D6-75.000.

Cronenberger, Michel: *See*—
Benattar, Robert; and Cronenberger, Michel, 270,565, Cl. D24-21.000.

Crowley, Joseph C., Jr.: *See*—
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 270,549, Cl. D19-76.000.

Davi, Richard A.: *See*—
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 270,549, Cl. D19-76.000.

DeVos, Hendrik A. J.; and Sitzema, Ronald L., Jr., to GTE Products Corporation. Luminaire reflector. 270,577, 9-13-83, Cl. D26-118.000.

DHV, Inc.: *See*—
Havener, Gary W., 270,571, Cl. D25-68.000.

Duering, Walter, to During AG. Bottle. 270,518, 9-13-83, Cl. D9-317.000.

Dunlap, Jerald V., to M-D & Co. Polisher. 270,515, 9-13-83, Cl. D8-67.000.

During AG: *See*—
Duering, Walter, 270,518, Cl. D9-317.000.

Echterling, Eugene J. Toy wagon. 270,552, 9-13-83, Cl. D21-76.000.

Echterling, Eugene J. Toy stroller. 270,553, 9-13-83, Cl. D21-134.000.

Ekuan, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Decoder for a digital audio discs player. 270,531, 9-13-83, Cl. D14-1.000.

Elliott, Randall L.; and Pickel, James A., to Liberty National Bank & Trust Co. Kiosk for automatic banking or the like. 270,583, 9-13-83, Cl. D99-28.000.

Fender, C. Leo. Guitar head. 270,544, 9-13-83, Cl. D17-20.000.

Fine Art Pillow & Specialties Corp.: *See*—
Schutz, Bernard R., 270,498, Cl. D6-48.000.

Friedman, Maxine C., to PCC Enterprises, Inc. Coaster. 270,511, 9-13-83, Cl. D7-45.000.

Fuller, Stanley D. Teeter-totter. 270,558, 9-13-83, Cl. D21-251.000.

GARDENA Kress & Kastner GmbH: *See*—
Clivio, Franco; and Raffler, Dieter, 270,559, Cl. D23-35.000.
Clivio, Franco; and Raffler, Dieter, 270,560, Cl. D23-35.000.

Giroflex-Entwicklungs AG: *See*—
Ochsner, Koni, 270,497, Cl. D6-30.000.

Goertz, Albrecht: *See*—
Burton, Robert W.; Crowley, Joseph C., Jr.; Davi, Richard A.; and Goertz, Albrecht, 270,549, Cl. D19-76.000.

GTE Products Corporation: *See*—
Broadt, David R.; and Audesse, Emery G., 270,575, Cl. D26-2.000.
DeVos, Hendrik A. J.; and Sitzema, Ronald L., Jr., 270,577, Cl. D26-118.000.

Guest Keen & Nettlefolds (Aust) Limited: *See*—
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84 C 4,404,441
144 R 4,404,442
147 A 4,404,443
153 J 4,404,436
4,404,444
314 4,404,445
320 4,404,446

CLASS 202

185 B 4,404,062

CLASS 203

6 4,404,063
84 4,404,064

CLASS 204

1 T 4,404,065
4,404,066
4 4,404,067
59 R 4,404,068
4,404,069
72 4,404,070
108 4,404,071
129.3 4,404,072
146 4,404,074
159.23 4,404,073
4,404,075
164 4,404,076
192 R 4,404,077
202 4,404,078
224 R 4,404,079
4,404,080
253 4,404,081
290 R 4,404,082

CLASS 206

158 4,403,689
163 4,403,690
214 4,403,691
223 4,403,692
339 4,403,693
347 4,403,694
497 4,403,695
623 4,403,696

CLASS 208

8 R 4,404,083
10 4,404,084
11 R 4,404,085
4,404,086
48 AA 4,404,087
59 4,404,088
120 4,404,089
4,404,090
131 4,404,091
4,404,092
139 4,404,094
161 4,404,095
188 4,404,096
210 4,404,097
235 4,404,098

CLASS 210

138 4,404,093
205 4,404,099
232 4,404,100
4,404,101
247 4,404,102
446 4,404,103
684 4,404,104
710 4,404,105
772 4,404,106

CLASS 211

13 4,403,697
60 S 4,403,698
69.1 4,403,699
88 4,403,700
133 4,403,701
189 4,403,702
193 4,403,703

CLASS 212

262 4,403,704

CLASS 213

1.3 4,403,705

CLASS 215

1 C 4,403,706
253 4,403,707

CLASS 219

64 4,404,447
69 G 4,404,448
69 V 4,404,449
76.12 4,404,450
80 4,404,451
121 LD 4,404,453
121 LK 4,404,452
4,404,454
124.34 4,404,455
137 PS 4,404,456
137.2 4,404,457
150 R 4,404,458
209 4,404,459
211 4,404,460
490 4,404,461
497 4,404,462
541 4,404,463

CLASS 220

3.5 4,403,708
90.4 4,403,709
270 4,403,710
335 4,403,711
339 4,403,712

CLASS 221

265 4,403,713

CLASS 222

101 4,403,714
361 4,403,715

CLASS 224

42.08 4,403,716
252 4,403,717

CLASS 226

27 4,403,718
188 4,403,719
190 4,403,720
191 4,403,721

CLASS 227

8 4,403,722
76 4,403,723
4,403,724
147 4,403,725
149 4,403,726

CLASS 229

27 4,403,727
39 R 4,403,728
4,403,729

CLASS 231

39 4,403,730

CLASS 235

438 4,404,464

CLASS 237

2 B 4,403,731
50 4,403,732

CLASS 238

10 E 4,403,733
372 4,403,734

CLASS 239

1 4,403,735
112 4,403,736
154 4,403,737
313 4,403,738
428.5 4,403,739
533.4 4,403,740
585 4,403,741

CLASS 241

29 4,403,742
194 4,403,743

CLASS 242

18 G 4,403,744
47.01 4,403,745
55.19 R 4,403,746
4,403,747
55.53 4,403,748
71.8 4,403,749
84.2 G 4,403,750
107.2 4,403,751
4,403,752
125.2 4,403,753
151 4,403,754

CLASS 244

53 R 4,403,755
223 4,403,756

CLASS 248

49 4,403,758
55 4,403,759
284 4,403,760
441 B 4,403,761
559 4,403,762
561 4,403,763

CLASS 250

203 R 4,404,465
211 J 4,404,466
270 4,404,467
342 4,404,468
363 R 4,404,469
390 4,404,470
482.1 4,404,471

CLASS 251

5 4,403,764
65 4,403,765

CLASS 252

8.5 A 4,404,108
8.5 M 4,404,107
8.55 B 4,404,112
8.55 D 4,404,109
4,404,111
8.55 R 4,404,110
75 4,404,113
4,404,114
135 4,404,115
182 4,404,116
182.1 4,404,117
411 R 4,404,118
413 4,404,119
426 4,404,120
4,404,121
432 4,404,122
463 4,404,123
466 PT 4,404,124
511 4,404,125
512 4,404,126
522 R 4,404,127
546 4,404,128
629 4,404,129
631 4,404,130

CLASS 254

399 4,403,766

CLASS 256

66 4,403,767

CLASS 260

112 B 4,404,131
4,404,132
112.5 E 4,404,135
112.5 R 4,404,133
4,404,134
147 4,404,136
239.3 T 4,404,137
244.4 4,404,138
369 4,404,140
397.3 4,404,141
397.45 4,404,142
400 4,404,143
410.9 R 4,404,144
419 4,404,145
429.9 4,404,146
439 CY 4,404,147
465 F 4,404,148
544 Y 4,404,149
927 R 4,404,150

CLASS 261

44 C 4,404,151

CLASS 264

15 4,404,152
29.2 4,404,153
62 4,404,154
67 4,404,155
162 4,404,156
195 4,404,157
263 4,404,158
296 4,404,159
328.16 4,404,161
328.9 4,404,160
514 4,404,162

CLASS 266

44 4,403,768
149 4,403,769

CLASS 270

55 4,403,770

CLASS 271

294 4,403,771

CLASS 272

78 4,403,772
134 4,403,773

CLASS 273

143 R 4,403,774
144 B 4,403,775
153 R 4,403,776
313 4,403,777

CLASS 277

1 4,403,778
27 4,403,779
88 4,403,780
212 FB 4,403,781

CLASS 279

121 4,403,782

CLASS 280

5 G 4,403,783
11.28 4,403,784
12 H 4,403,785
289 H 4,403,787
289 WC 4,403,786
605 4,403,788
614 4,403,789
637 4,403,790

CLASS 282

27.5 4,403,791
4,403,792

CLASS 283

105 4,403,793

CLASS 285

45 4,403,794
184 4,403,795
223 4,403,796

CLASS 289

17 4,403,797

CLASS 292

256.5 4,403,798
285 4,403,799
350 4,403,800

CLASS 294

93 4,403,801

CLASS 296

25 4,403,802
179 4,403,803
183 4,403,804
221 4,403,805

CLASS 297

217 4,403,806
4,403,807

CLASS 299

34 4,403,808
4,403,809

CLASS 307

46 4,404,472
125 4,404,473
260 4,404,474
264 4,404,475
268 4,404,476
297 4,404,477
315 4,404,478
353 4,404,479
475 4,404,480
491 4,404,481

CLASS 308

6 C 4,403,811
184 R 4,403,812
207 R 4,403,813
236 4,403,814

CLASS 310

11 4,404,482
42 4,404,483
49 R 4,404,484
198 4,404,485
4,404,486
239 4,404,487
4,404,488
334 4,404,489
339 4,404,490

CLASS 312

7.2 4,403,815
184 4,403,816
330 R 4,403,817

CLASS 313

318 4,404,491
355 4,404,492
422 4,404,493

CLASS 315

3.5 4,404,494
5.41 4,404,495
151 4,404,496
241 P 4,404,497
241 R 4,404,498
371 4,404,499
386 4,404,500

CLASS 318

7 4,404,501
116 4,404,502
119 4,404,503
269 4,404,504
561 4,404,505
4,404,506
570 4,404,507
611 4,404,508
685 4,404,509
696 4,404,510
729 4,404,511
807 4,404,512

CLASS 322

90 4,404,513

CLASS 324

52 4,404,514
54 4,404,515
4,404,516
57 R 4,404,517
62 4,404,518
73 R 4,404,519
82 4,404,520
110 4,404,521
114 4,404,522
207 4,404,523
459 4,404,524

CLASS 330

9 4,404,525
10 4,404,526
84 4,404,527
288 4,404,528
303 4,404,529

CLASS 331

1 A 4,404,530
64 4,404,531

CLASS 332

17 4,404,532

CLASS 335

131 4,404,533

CLASS 336

197 4,404,534

CLASS 337

66 4,404,535
201 4,404,536
232 4,404,537
336 4,404,538

CLASS 338

3 4,404,539
161 4,404,540

CLASS 339

10 4,403,818
75 MP 4,403,819
97 P 4,403,821
97 R 4,403,820
108 TP 4,403,822
126 R 4,403,823
186 R 4,403,824

CLASS 340

32 4,404,541
146.2 4,404,542
323 R 4,404,543
347 AD 4,404,544
347 DA 4,404,546
347 NT 4,404,545
365 R 4,404,547
505 4,404,548
574 4,404,549
628 4,404,550
711 4,404,551
721 4,404,552
728 4,404,553
750 4,404,554
784 4,404,555
825.03 4,404,556
825.05 4,404,557
825.72 4,404,558
870.28 4,404,559
870.37 4,404,560

CLASS 343

16 R 4,404,561
17.2 PC 4,404,562
100 SA 4,404,563
750 4,404,564
881 4,404,565

CLASS 346

1.1 4,404,566
76 PH 4,404,567
4,404,568
108 4,404,569
4,404,570
4,404,571
140 R 4,404,572
4,404,573
153.1 4,404,574

CLASS 350

96.11 4,403,825
96.30 4,403,826
162.17 4,403,827
288 4,403,828
289 4,403,829
331 R 4,403,830
334 4,403,831
335 4,403,832
356 4,403,833
371 4,403,834
414 4,403,835
444 4,403,836
465 4,403,837
500 4,403,838
514 4,403,839

CLASS 351

41 4,403,840
215 4,403,841
237 4,403,842

CLASS 354

25 4,403,843
234 4,403,844
275 4,403,845
310 4,403,846

CLASS 355

3 TR 4,403,847
4 4,403,848
8 4,403,849
14 R 4,403,850
4,403,851
15 4,403,852
16 4,403,853
41 4,403,854
64 4,403,855
75 4,403,856

CLASS 356

5 4,403,857
237 4,403,858
374 4,403,859
375 4,403,860
407 4,403,861
437 4,403,862

CLASS 357

22 4,404,575
23 4,404,576
4,404,577
4,404,578
4,404,579
38 4,404,580
59 4,404,581
79 4,404,582

CLASS 358

13 4,404,583
31 4,404,584
41 4,404,585
44 4,404,586
4,404,587
60 4,404,588
86 4,404,589
106 4,404,590
111 4,404,591
125 4,404,592
168 4,404,593
209 4,404,594
227 4,404,595
293 4,404,596
4,404,597
296 4,404,598

342 4,404,599
905 4,404,600

CLASS 360

10.3 4,404,601
13 4,404,602
33.1 4,404,603
71 4,404,604
77 4,404,605
105 4,404,606
4,404,607
126 4,404,608
4,404,609
137 4,404,610
4,404,611

CLASS 361

31 4,404,612
104 4,404,613
128 4,404,614
212 4,404,615
213 Re.31,382
253 4,404,616
424 4,404,617

CLASS 362

17 4,404,618
222 4,404,619
304 4,404,620
419 4,404,621

CLASS 363

27 4,404,622
56 4,404,623
59 4,404,624

CLASS 364

144 4,404,625
174 4,404,626
200 4,404,628
4,404,629
4,404,630
414 4,404,631
425 4,404,632
426 Re.31,383
4,404,633
472 4,404,634
481 4,404,635
482 4,404,636
494 4,404,637
510 4,404,638
551 4,404,639
4,404,640
569 4,404,641
571 4,404,642
705 4,404,643
718 4,404,644
728 4,404,645
803 4,404,646
900 4,404,627
4,404,647
4,404,648
4,404,649
4,404,650
4,404,651

CLASS 365

8 4,404,652
49 4,404,653
103 4,404,654
104 4,404,655
126 4,404,656
154 4,404,657
4,404,658
185 4,404,659
193 4,404,660
203 4,404,661
4,404,662
206 4,404,663

CLASS 366

8 4,403,863
19 4,403,864
44 4,403,865
132 4,403,866
142 4,403,867
295 4,403,868

CLASS 367

19 4,404,664
100 4,404,665
131 4,404,666

CLASS 368

10 4,403,869
294 4,403,870

CLASS 369

65 4,404,667
4,404,668
170 4,404,669
4,404,670
216 4,404,671

CLASS 370

29 4,404,672

CLASS 371

13 4,404,673
43 4,404,674
47 4,404,675
4,404,676
69 4,404,677

CLASS 372

45 4,404,678
54 4,404,679

CLASS 374

1 4,403,871
138 4,403,872

CLASS 375

102 4,404,681
111 4,404,680

CLASS 376

119 4,404,163
154 4,404,164
272 4,404,165

CLASS 378

72 4,404,682

CLASS 382

6 4,404,683
25 4,404,684

CLASS 384

306 4,403,873

CLASS 400

124 4,403,874
4,403,875
144.2 4,403,876
335 4,403,877
585 4,403,878
674 4,403,879

CLASS 401

134 4,403,880
202 4,403,881

CLASS 402

4 4,403,882
79 4,403,883

CLASS 403

217 4,403,886
284 4,403,884
317 4,403,885

CLASS 404

72 4,403,889

CLASS 405

53 4,403,887
68 4,403,888
184 4,403,890
264 4,403,891

CLASS 408

95 4,403,892

CLASS 411

38 4,403,893
47 4,403,894
378 4,403,895

CLASS 412

38 4,403,896

CLASS 414

22 4,403,897
4,403,898
35 4,403,899
137 4,403,900
422 4,403,901
569 4,403,902
607 4,403,903
634 4,403,904
695.5 4,403,905
724 4,403,906
744 R 4,403,907
786 4,403,908
4,403,909

CLASS 415

53 T 4,403,910
90 4,403,911
150 4,403,912
4,403,913
165 4,403,914
199.5 4,403,915

CLASS 416

14 4,403,916
96 A 4,403,917
138 4,403,918

CLASS 417

53 4,403,919
295 4,403,920
296 4,403,921
310 Re.31,379
358 4,403,922
360 4,403,923
388 4,403,924
395 4,403,925
553 4,403,926

CLASS 418

55 4,403,927
60 4,403,928
82 4,403,929
121 4,403,930

CLASS 419

36 4,404,166

CLASS 422

12 4,404,167
119 4,404,168
237 4,404,170
241 4,404,171
248 4,404,172
257 4,404,173

CLASS 423

35 4,404,169
112 4,404,174
329 4,404,175
387 4,404,176
448 4,404,177
450 4,404,178
500 4,404,179
563 4,404,180

CLASS 424

3 4,404,181
5 4,404,182
19 4,404,183
49 4,404,184
84 4,404,185
92 4,404,186
101 4,404,187
105 4,404,188
114 4,404,189
118 4,404,190
130 4,404,191
153 4,404,192
176 4,404,193
177 4,404,194
180 4,404,195
184 4,404,196
229 4,404,197
235 4,404,198
238 4,404,199
241 4,404,200
246 4,404,201
248.5 4,404,202
250 4,404,203
4,404,204
251 4,404,205
4,404,212
258 4,404,206
4,404,207
260 4,404,208
4,404,209
4,404,210
4,404,211
263 4,404,213
266 4,404,214
267 4,404,215
269 4,404,216
274 4,404,217
4,404,218
4,404,219
275 4,404,220
285 4,404,221
304 4,404,222
4,404,223
321 4,404,224
322 4,404,225
326 4,404,226

CLASS 425

84 4,403,931
85 4,403,932
129 R 4,403,933
192 R 4,403,934
210 4,403,935
331 4,403,936
337 4,403,937
393 4,403,938
425 4,403,939
529 4,403,940
589 4,403,810

CLASS 426

19 4,404,227
98 4,404,228
513 4,404,229
548 4,404,230
602 4,404,231

CLASS 427

8 4,404,232
35 4,404,233
37 4,404,234
89 4,404,235
94 4,404,236
96 4,404,237
128 4,404,238
393 4,404,239

CLASS 428

8 4,404,240
35 4,404,241
4,404,242
62 4,404,243
109 4,404,244
206 4,404,245
212 4,404,246
213 4,404,247
215 4,404,248
216 4,404,249
220 4,404,250
320.6 4,404,251
326 4,404,252
327 4,404,253
329 4,404,254
406 4,404,255
409 4,404,256
412 4,404,257
424.6 4,404,258
425.9 4,404,259
458 4,404,260
480 4,404,261
539.5 4,404,262
564 4,404,263
573 4,404,264
689 4,404,265

CLASS 429

27 4,404,266
41 4,404,267
191 4,404,268

CLASS 430

106 4,404,269
110 4,404,270
4,404,271
192 4,404,272
377 4,404,273
389 4,404,274
501 4,404,275
531 4,404,276
597 4,404,277

CLASS 431

10 4,403,941
24 4,403,942
31 4,403,943
90 4,403,944
150 4,403,945
255 4,403,946
353 4,403,947

CLASS 432

1 4,403,948
29 4,403,949
60 4,403,950
96 4,403,951
103 4,403,952
122 4,403,953
124 4,403,954
158 4,403,955

CLASS 433

29 4,403,956
4,403,957
100 4,403,958
126 4,403,959
177 4,403,960
213 4,403,961

CLASS 434

94 4,403,962
100 4,403,963
286 4,403,964
327 4,403,965
335 4,403,966
337 4,403,967

CLASS 435

7 4,404,278
68 4,404,279
4,404,280
122 4,404,281
4,404,282
134 4,404,283
291 4,404,284

CLASS 436

16 4,404,285
97 4,404,286
109 4,404,287
177 4,404,288
538 4,404,289

CLASS 440

3 4,403,968
56 4,403,969
75 4,403,970
88 4,403,971
4,403,972

CLASS 445

28 4,403,973

CLASS 455

76 4,404,685
191 4,404,686

CLASS 474

11 4,403,974
18 4,403,975
19 4,403,976
80 4,403,977
82 4,403,978
153 4,403,979

CLASS 493

419 4,403,981

CLASS 501

78 4,404,290
81 4,404,291
97 4,404,292
139 4,404,029

CLASS 521

29 4,404,346
56 4,404,293
107 4,404,294
172 4,404,295

CLASS 523

105 4,404,296
179 4,404,297

CLASS 524

31 4,404,298
77 4,404,299
91 4,404,300
99 4,404,301
100 4,404,302
4,404,303
110 4,404,304
118 4,404,305
262 4,404,306
290 4,404,307
379 4,404,308
4,404,309
457 4,404,310
486 4,404,311
504 4,404,312
512 4,404,313
519 4,404,314
521 4,404,315
522 4,404,316
538 4,404,317
588 4,404,318

CLASS 525

39 4,404,319
58 4,404,320
68 4,404,321
74 4,404,322
86 4,404,323
123 4,404,324
179 4,404,325
223 4,404,326
228 4,404,327
274 4,404,328
329.2 4,404,329
374 4,404,330
424 4,404,331
428 4,404,332
437 4,404,333
504 4,404,334
507 4,404,335
531 4,404,336

CLASS 526

62 4,404,337
86 4,404,338
88 4,404,339
97 4,404,340
125 4,404,341
4,404,342
142 4,404,343
160 4,404,344
206 4,404,345

CLASS 527

300 4,404,347

CLASS 528

15 4,404,348
25 4,404,349
26 4,404,350
45 4,404,352
67 4,404,353
86 4,404,354
89 4,404,355
99 4,404,356
153 4,404,357
158.5 4,404,358
174 4,404,351
216 4,404,359
326 4,404,360
342 4,404,361
422 4,404,362
486 4,404,363
502 4,404,364

CLASS 536

4.1 4,404,365
18.1 4,404,366
4,404,367
27 4,404,368
30 4,404,369
85 4,404,370
98 4,404,371

CLASS 542

429 4,404,372

CLASS 544

21 4,404,373
26 4,404,374
27 4,404,375
4,404,376
87 4,404,377
131 4,404,378
231 4,404,379
251 4,404,380
357 4,404,381
360 4,404,382
379 4,404,383
394 4,404,384

CLASS 546

37 4,404,385
4,404,386
193 4,404,387
345 4,404,388

CLASS 548

201 4,404,389
263 4,404,390
423 4,404,139
552 4,404,391

CLASS 549

526 Re.31,381

CLASS 560

40 4,404,392
121 4,404,393
204 4,404,394
209 4,404,395

CLASS 562

465 4,404,396
546 4,404,397
598 4,404,398

CLASS 564

402 4,404,399
406 4,404,400
416 4,404,401
442 4,404,402
473 4,404,403
4,404,404
482 4,404,405

CLASS 568

571 4,404,406
648 4,404,407
680 4,404,408
697 4,404,409
858 4,404,410
861 4,404,411

CLASS 570

109 4,404,412

CLASS 585

2 4,404,413
469 4,404,414
512 4,404,415
671 4,404,416
4,404,417
710 4,404,418
723 4,404,419

CLASS 604

28 4,403,982
43 4,403,983
50 4,403,984
53 4,403,985
61 4,403,610
70 4,403,609
4,403,986
73 4,403,611
115 4,403,987
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	24	270,490		199	270,506	D10—	15	270,522			270,538		190	270,554		56	270,570
		270,491	D7—	9	270,507		22	270,523			270,539		192	270,555		68	270,571
D3—	30.1	270,493		17	270,508		53	270,524		31	270,540		233	270,556			270,572
	33	270,494		43	270,509	D11—	125	270,525			270,541		235	270,557			270,573
	36	270,495		44	270,510	D12—	12	270,526		38	270,542		251	270,558			270,574
	50	270,496		45	270,511		114	270,527	D17—	19	270,543	D23—	35	270,559	D26—	2	270,575
D6—	30	270,497		54	270,512		155	270,528		20	270,544			270,560		39	270,576
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